

The Genera and Species of the Tridenchthoniidae (Dithidae)

A Family of the Arachnid
Order Chelonethida

BY

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THE GENERA AND SPECIES OF THE TRIDENCHTHONIIDAE
(DITHIDAE), A FAMILY OF THE ARACHNID
ORDER CHELONETHIDA*

BY JOSEPH C. CHAMBERLIN¹ AND RALPH V. CHAMBERLIN

In 1931, J. C. Chamberlin published an extensive treatise on the comparative external morphology and higher classification of the Chelonethida (pseudoscorpions or false scorpions).² At that time it was the purpose to follow this work with a second volume dealing with the generic classification of the order in the same way as that contribution dealt with families and superfamilies.

This plan had to be deferred for various reasons; but as it happened, the publication of the above noted work and its precursors stimulated a considerable amount of revisional work during the years 1930-1937 by various other authors, principally Beier, Vachon, and Redikorzev; so that the order, which before 1929 had comprised 5 families and about 37 genera, of which only 18 were regarded as well founded, had by 1937 come to comprise 18 families and about 170 more or less well-defined genera.

This period of activity has now largely come to a close and it is planned to go ahead, in a modified way, with the studies on the generic and super-generic classification originally conceived in 1929-1931. Owing to various circumstances, it is not possible to complete this work as a single contribution in the reasonably near future. Therefore, in order to make the studies available for use as rapidly as possible, they will be published from time to time in a series of independent sections dealing with family or sub-family groups. The present paper on the family Tridenchthoniidae represents the first of this series.

Primary emphasis will be laid upon the definition and intra-familial relationships of the genera and other phases of the higher classification. In addition, keys to species will be given throughout, and new and little known forms will be described wherever material makes this possible. Finally, the work will comprise an annotated catalogue in which all species will be listed and all pertinent references cited.

The concept of the families, superfamilies, and suborders defined by Chamberlin in 1931 (l.c.) has not been significantly affected by researches conducted since that time, although Beier in his monographic revision of 1932 (Das Tierreich, Vols. 57 and 58) took that occasion for "renaming" the three suborders and five superfamilies recognized by Chamberlin. This

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²The Arachnid Order Chelonethida. Stanford University Press, 1931.

parallel series of names is in strict synonymy with those proposed by the latter author, and their use should be abandoned.

In 1931 (Chamberlin, *The Chelonethida*, p. 24, fig. 1.) the key points from which it was suggested that appendicular measurements be made were illustrated.

As far as species descriptions are concerned, we have since omitted measurements of the coxae, the pedal trochanters, and the chelicerae as unnecessary. Furthermore, measurements of the pedal femora have been simplified where the interfemoral articulation is symphytic or nearly so. In these cases the combined length of both subsegments only is taken, together with the greatest depth. The method of taking these two measurements is shown in fig. 2, G. Where the femoral subsegments are joined by a more or less typical ginglymous articulation, as in leg 1 of the present family (fig. 2, F), the subsegments are measured independently as already described (Chamberlin, 1931 l.c.). In general, appendicular measurements and proportions, especially of the legs, are remarkably uniform throughout the family and the systematic usefulness of these characteristics is limited even in the discrimination of species.

As of current date, the number of species assigned to this family is small (14 genera and 30 species). This is certainly only a small fraction of those actually existing. Few are known from more than one or two records, and no single, large, geographical area within the range of their probable occurrence can be considered even fairly well explored.

Furthermore, no species at all are currently recorded from such large geographical areas as Asia (exclusive of Malaysia), the Belgian Congo, Angola, Southwest Africa, Rhodesia, Mozambique, Madagascar, Australia, Oceania, or Central America, although representatives undoubtedly occur in the fauna of all these regions.

Their small size and obscure habitats will preclude their capture by any but the most assiduous collector, and it will probably be a long time before the world fauna will be known in more than sketchy outline.

The name *Dithidae* under which this group has been known heretofore, was proposed in 1929 with *Ditha* as the type genus. It has since been established that Balzan's genus *Tridenchthonius* (the type species of which was based upon a nymphal stage, probably the tritonymph), is undoubtedly a member of this group (Beier, *Das Tierreich* 57:34). In 1891, L. Balzan made his genus the type of the family *Tridenchthoniidae* (*Ann. Soc. ent. Fr.* 60:509). The name *Dithidae* is therefore nomenclatorially, although not conceptually, a synonym.

Family TRIDENCHTHONIIDAE Balzan

1891. *Tridenchthoniidae* L. Balzan, *Ann. Soc. ent. Fr.*, 60:504, 505 and 509. (Family, type genus and type species defined essentially as a chthoniid possessing a trigaleate spinneret. Now known to be a nymphal characteristic only.)
1894. *Tridenchthoniinae* Hansen, *Ent. Meddel. Ent. Foren. Copenhagen*. 4:3-5; 230 and 232. (Regarded the group as of subfamily status under the Chthoniidae. No new data.)

1906. *Tridenchthoniinae* Hansen, With, Kgl. Danske Vid. Selsk. Skr. Copenhagen. Ser. 7, 3:64. (A critical consideration of the taxonomic status of the subfamily. Conclusions essentially those of Hansen. No new data.)
1925. *Tridenchthoniinae* Balzan, Chamberlin, Vid. Medd. Danske naturh. Foren. 81:334. (Listed; no new data.)
1929. *Dithinae* + *Tridenchthoniinae* Hansen, Chamberlin, Ann. Mag. Nat. Hist. Ser. 10:4:58 (*Dithinae* nov.) and 77 (*Tridenchthoniinae*). (The first definition of the group as now recognized. *Tridenchthoniinae* still regarded as belonging to the *Chthoniidae*.)
1931. *Dithidae* Chamberlin + *Tridenchthoniinae* Hansen, Chamberlin, The Chelonethida, 209 (*Dithidae*) and 212 (*Tridenchthoniinae*; still regarded as pertaining to the *Chthoniidae*).
1932. *Dithinae* Chamberlin, Beier, Das Tierreich, 57:24. (The genus *Tridenchthonius* is here first assigned to the present group.)
1932. *Dithidae* Chamberlin, Beier, Handbuch der Zoologie. Willy Kuenthal. 3:(2):181.
1937. *Dithidae* Chamberlin, Roewer, Bronn's Klass. und Ord. des Tierreichs. 5:(IV:6):233 and 318.
1939. *Dithinae* Chamberlin, Mello-Leitao. Notes del museo de la Plata 4:(Zoologia No. 17):115. (Listed only; group recognized as of subfamily rank under *Chthoniidae*.)

DIAGNOSIS (Emended). With characters of the suborder Heterosphyronida and the superfamily Chthonioidea. General facies as shown in fig. 1.

Chela with setae IB and ISB closely adjacent, transversely paired, and occurring, subbasally to submedially on the dorsum of the hand (figs. 2-J and 17, respectively).

Interfemoral articulation of leg IV almost median, nearly immobile; basifemur as long as or longer than the telofemur (fig. 2-G).

Carapace with nearly parallel sides—not markedly constricted at point of junction with the abdomen, which is also nearly parallel sided and generally not markedly expanded caudad of the posterior margin of the cephalothorax. The abdomen, in general, is proportionally reduced, being little larger than the cephalothorax or even smaller. The fourth legs most often extend well caudad of the abdominal tip (fig. 1).

Guard sclerites of the spiracles generally well differentiated, strongly recurved, and obliquely oriented (fig. 1; fig. 2, A).

Chelicerae lacking a differentiated spinneret (galea) in adults of the typical subfamily, but juvenile examples of *Cryptoditha* and *Tridenchthonius* at least, characterized by multiple simple galeae. In the one known species of the subfamily Cecodithinae the adult is reported to possess a simple galea. Flagellum consisting of three or four pairs of pinnate setae (six or seven blades in all).

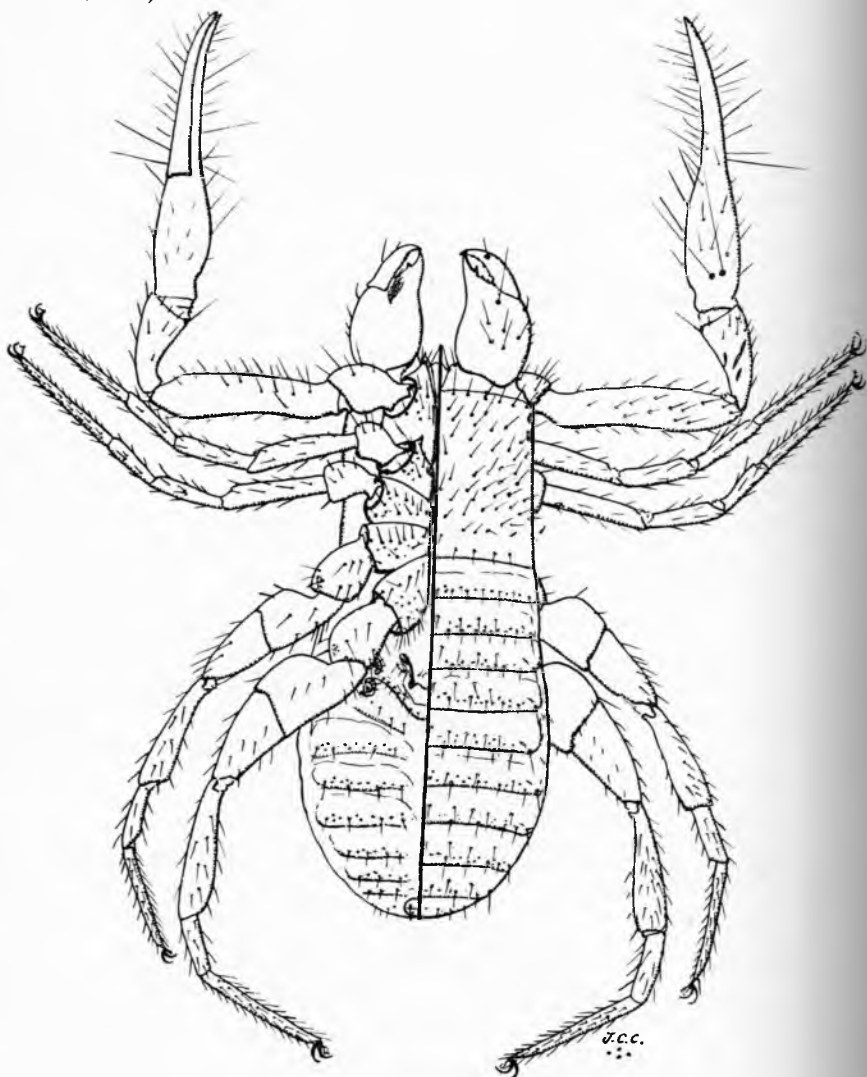
Anterior tracheal trunks very elongate, with lateral branching and with the main trunk extending cephalad well into the maxillae.

Eleventh tergite and sternite fused into a single terminal or sub-ventral circum-anal plate, of which the tergal element is most strongly developed (fig. 13, A); anal operculum (reduced 12th tergite and sternite) with sternal element most sclerotic; tergal half of anal operculum non-setose; sternal half generally, at least, bi-setose.

FIGURE 1.

General appearance of a number of the Tridenchthoniidae.

Tridenchthonius cubanus (Chamberlin), Female. Left Side Ventral; Right Dorsal (From Chamberlin, 1931).



Intercoxal tubercle, when present, very minute and monosetose.

Female genital area with heavily sclerotic, lateral plates (fig. 2, A).

Male genital area of the usual chthonioid type (figs. 2, H and I).

In all but one species, so far known, coxal spines occur on coxae I and II and comprise a contiguous series of three to six broadly acuminate or variously incised blades. The single species representing the Cecodithinae subfamily nov. reportedly lacks coxal spines entirely.

In all species studied, the first coxae are characterized by a small, forward projecting, spine-like process on their anterior mesal margins (fig. 2, B).

METAMORPHOSIS. Material included in the two new Mexican species of *Tridenchthonius* herein described (*juxtlahuaca* and *mexicanus* spp. n.) makes it possible for the first time to give some indications as to the course and nature of the growth and metamorphosis for a representative of this family. Both tritonymph and protonymph are available, but no deutonymph. The two stages available (each belonging to a different but closely related species) are described under the specific headings.

The facies of the nymphs, even of the protonymph, is in general that of the adult, although the general proportions of all appendages are more robust. The nature of the changes in the more important systematic characters are herewith listed.

Intercoxal tubercle. Absent in the protonymph, but present in the tritonymph and in the adult.

Coxal spines. Present in all stages; as in the adult, except blades less numerous in the protonymph.

Chelicera. Trigleate spinneret present in the protonymph and tritonymph, but absent in the adult. Galeal seta absent in the protonymph, but present in tritonymph and adult. Number of setae of palm of chelicera reduced in nymphal stages; reduction greatest in protonymph.

Carapace. Chaetotaxy greatly reduced in protonymph (total $18 \pm$); markedly reduced in tritonymph (50 as compared to 85-90 in the adult), but with anterior and posterior border setae numbering the same as in the adult. Epistomal process not developed in protonymph, moderately developed in the tritonymph and well developed in the adult.

Tergites. Number of vestitural setae greatly reduced in protonymph and to a lesser degree in the tritonymph, the full complement present only in the adult; arrangement of setae uniseriate in protonymph and tritonymph; biseriate in adult (of these particular species).

Dentition of Chela. Marginal teeth of chela greatly reduced in number in protonymph, but of the same form and type of development as in the adult and tritonymph, which scarcely differ in this characteristic (compare figs. 14, B and 15, E).

Chaetotaxy of Chela. The normal complement of 12 setae plus the chthonioid double seta DS present only in the adult (fig. 15, A). In the tritonymph one of the basal setae normally situated dorsally on the base of the hand (probably IB) is absent, as is B, at the base of the movable finger. Otherwise the full complement of setae, including DS, is present. Setae SB and ST of the movable finger are well separated, however, unlike the adult, where they are contiguous (compare figures 15, A and D).

The deutonymph is not yet known, but without question the number

of tactile setae will be found to be fewer than in the tritonymph (probably 6 on the fixed and 2 on the movable finger).

In the protonymph the chaetotaxy is greatly reduced, only a single tactile seta occurring on the movable and 3 on the fixed finger. The homologies of these setae are uncertain. Seta DS is also lacking in the protonymph (fig. 14, A).

Legs. The segmentation and general form of the legs is the same in all stages, except for the proportions, which are more robust in the nymph. The tarsal tactile setae of the metatarsus and tarsus of leg IV are present in the protonymph and tritonymph as in the adult.

GEOGRAPHICAL RANGE. The range of the family as a whole is almost entirely tropical and subtropical. Grouped by area, the known distribution may be summarized as follows:

- | | |
|-------------------------------------|--|
| North America:
(Nearctic) | Indiana, Ohio, Mississippi, North Carolina, Florida, Cuba, Jamaica, Mexico (2 genera and 4 species). |
| Central America:
(Neotropical) | None yet recorded. |
| South America:
(Neotropical) | Venezuela, Dutch Guiana, Ecuador, Brazil, Paraguay, Argentine (7 genera and 13 species; 1 genus and 2 species of doubtful status). |
| Africa:
(Ethiopian) | Nigeria, Gold Coast, Portuguese Guinea, Uganda north of Lake Victoria (Mt. Elgon), Tanganyika "East Africa," Natal, Zululand, Cape of Good Hope (5 genera and 10 species). |
| Malaysia:
(Malayan) | Philippine Islands, Sumatra, Java, Banda Islands (3 genera and 5 species). |
| Asia: (Palaearctic
and Oriental) | None yet recorded. |
| Europe:
(Palaearctic) | Germany (Fossil; Baltic amber), (1 genus and 1 species). |
| Australia:
(Australian) | None yet recorded. |
| Oceania: | None yet recorded. |

With the exception of the one fossil European species and one living species which ranges north in the eastern part of the United States to about latitude 40° North, all records for members of this family occur within a zone defined by latitudes 30° North and 35° South.

PALAEONTOLOGICAL RANGE. One fossil species (*Chelignathus kochii* Menge) is thus far known. It is from the Baltic Amber (Oligocene) and is

FIGURE 2.

Structures of systematic importance in the family Tridenchthoniidae.
Compsaditha pygmaea (Chamberlin).

A—Female genital area and spiracles. Typical of family. (JC-530.01001).

F—Leg I (female—550.05001).

G—Leg IV Arrows indicate method of measuring length and depth of femur when inter-femoral articulation is symphytic or nearly so. (female—JC-550.05001).

Verrucaditha spinosa (Banks).

B—Left coxa I showing anterior mesal process and coxal spines (male).

C—Marginal teeth near tip of movable finger of chela (JC-287.01001).

D—Spaced marginal teeth typical of tribe Verrucadithiini. Fixed finger of chela (JC-287.01001).

H—Male genital operculum. Typical of family (JC-741.01001).

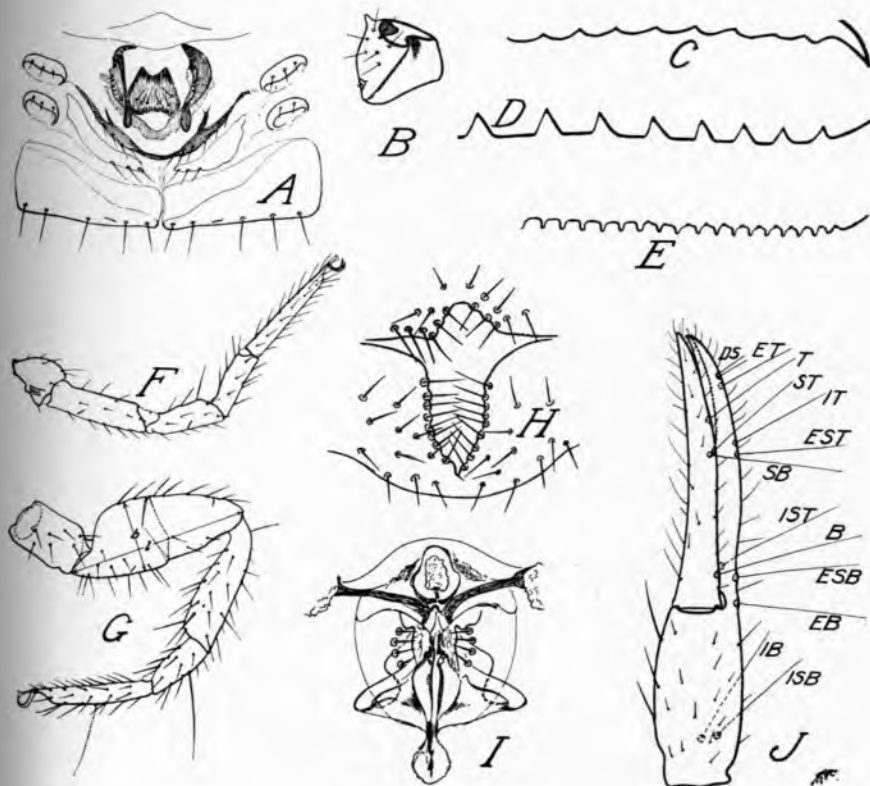
I—Internal structures of male genitalia. Typical of family (JC-741.01001).

Ditha philippinensis (Chamberlin).

E—Contiguous marginal teeth typical of the tribe Tridenchthoniini. Tip of fixed finger (female—JC-284.01002).

Tridenchthonius cubanus (Chamberlin).

J—Ventral aspect of left chela showing basal position of tactile setae ISB and IB characteristic of the typical family (female—Holotype).



fairly closely related to living species occurring in South America, Africa, and Sumatra.

VERTICAL RANGE. For only two species of this family are exact data available on the elevation at which representatives have been captured. One is the African species *Verrucadithella jeanneli* Beier, which is thus far known only from two collections taken on Mt. Elgon (Uganda north of Lake Victoria), at elevations of 2,300 and 2,470 meters, respectively (=7,546 and 8,104 feet, respectively). One collection of *Tridenchthonius mexicanus* was taken at 800 meters altitude (=2,625 feet.)

Although elevations for other species have not been explicitly recorded, such data can be reasonably closely inferred from recorded data on geographical occurrence. Such data indicate that the majority of species thus far known occur at low to moderate elevations ranging from close to sea level to not more than 1,000 to 1,500 feet. Undoubtedly *V. jeanneli* is the highest ranging species of the family thus far known.

BIOLOGY. Practically nothing of the biology of any representative of this family is yet known, but a few general ideas can be pieced together.

Breeding probably occurs throughout the year. This is suggested by the observations of Godfrey (in: Ellingsen 1912. Ann. South Afric. Mus. 10:122), who has recorded the presence of larva-carrying females of the South African species *Xenoditha mordax* (Tullgren) during the months of April, August, September, October and December.

Godfrey (l.c.) reports this species as apparently not spinning cocoons for "any purpose." It is, however, almost certain that this habit does exist as far as moulting cocoons are concerned. In at least four species, *Tridenchthonius parvulus* Balzan, *Tridenchthonius juxtlahuaca* n.sp., *Tridenchthonius mexicanus* n.sp., and *Cryptoditha elegans* (Beier), galeate spinnerets occur in juvenile examples, a fact which strongly bears out this inference.

The larva-bearing female is apparently active throughout the period of embryonic and larval development. The number of larvae produced is apparently relatively small, numbering between four and twelve (*Xenoditha mordax* (Tullgren) four to nine, average about seven; *Verrucadithella dilatimanus* (Redikorzev) seven to nine; *Tridenchthonius juxtlahuaca* n.sp. eight to twelve; *Tridenchthonius mexicanus* n.sp. eight to twelve; and *Heterolophus clathratus* (Tullgren) four (one record)).

While no detailed ecological data are available, habitat records are available for twelve of the included species. These are so few that they may be profitably listed. *Xenoditha mordax* (Tullgren) (Africa) has been recorded as collected "under leaves"; *Verrucadithella dilatimanus* (Redikorzev) (East Africa) was collected under leaven of the bamboo and among lichens on trees; *Verrucaditha spinosa* (Banks) (United States) has been taken from logs and stumps, apparently most frequently in moist situations; *Anisoditha curvidigitata* (Balzan) (Paraguay) was collected from "dry leaves"; *Tri-*

denchthonius parvidentatus (Balzan) (Paraguay) was taken in rotting debris beneath the bark of a tree; *Tridenchthonius surinamus* (Beier) (Dutch Guiana) was collected from a fallen tree; *Tridenchthonius aburi* n.sp. (Gold Coast) was from decaying debris under a log; *Tridenchthonius parvulus* (Balzan) (Paraguay) was taken "under bark"; while *Tridenchthonius mexicanus* n.sp. occurs under bark and in moist leaves.

In addition to the foregoing, *Dithella javana* (Tullgren) is thus far known only from specimens taken under the elytra of a Passalid beetle in Java; and of the two known collections of *Tridenchthonius serrulatus* (Silvestri) (Nigeria), one was taken from a termite gallery, while the other was taken from a carabid beetle (presumably under the elytra).

Only one species, *Tridenchthonius juxtlahuaca* n.sp., has thus far been recorded from a cavernicolous habitat. It is closely similar to related "free-living" forms and the apparently complete absence of the posterior eyes (which, however, are normally reduced or even vestigial) is the only morphological feature suggesting a cavernicolous environment. The coloration seems to be "normal." Generalizing from what is thus far known, it appears that the Tridenchthoniids are characteristically humus-, leaf mould-, or soil-inhabiting forms, with some occurring in protected situations under the bark of trees or logs. As a surmise we are inclined to believe that when the soil fauna of the tropics and subtropics is explored, representatives of this family will be found in relative abundance and that in certain situations they will constitute an important element in the population of small predators.

Nothing is yet specifically known of the mating habits, embryology, food habits, natural enemies, or exact ecological significance of any representative of the family.

HISTORY OF THE GROUP. When Balzan first proposed the family Tridenchthoniidae, its only included species was defined in essence as a chthoniid possessing a triple galea. Balzan knew the species from two specimens only and these have never, apparently, been seen since by any subsequent student. It was not, in fact, until Beier described the species *Tridenchthonius elegans* in 1931 (Zool. Anz. 93:52) that anyone, other than Balzan, had seen actual material possessing this unique character. Beier described his species from both nymphs and adults and was thus able to show, for the first time, that the galeate spinneret was a juvenile characteristic. Further, the adults were undoubtedly members of the Tridenchthoniidae as then recognized. While Beier was undoubtedly in error in assigning his species to *Tridenchthonius*, as shown hereinafter (his species is here made the genotype of the new genus *Cryptoditha* q.v.), his finding was of great interest and importance. Since *Cryptoditha* and *Tridenchthonius* are actually widely separated, systematically speaking, it is our opinion that most, if not all nymphal Tridenchthoniinae, will be found to possess galeate spinnerets.

In this paper certain new species of *Tridenchthonius* from Mexico are described both on the basis of adults and two nymphal stages (tritonymph

and protonymph). Both stages possess the tri-galeate spinneret exactly as described and figured by Balzan. The nymph of Beier's species *Cryptoditha elegans* possesses a similar spinneret, which comprises, however, a series of five rather than three simple galeae.

In 1939 Mello-Leitao described the species *Cecoditha parva* from Argentine. It was represented in his collection by a single male specimen. This species, if correctly described, is unique in possessing a simple galea ("Galea sencilla") in the adult stage. This feature, together with the fact that the species also reportedly lacks coxal spines and had the tactile setae IB and ISB placed submedianally instead of subbasally on the dorsum of the hand of the chela, sets the species widely apart from all other known *Tridenchthoniidae* and necessitates its segregation in a separate subfamily (*Cecodithinae*, nov.)

The characters which actually separate and define this family, as far as the adult stages are concerned, were first discriminated in 1929 by Chamberlin, who gave the group subfamily ranking (*Dithinae*). In 1931 Chamberlin raised the group to family status. As then recognized, the family included three genera (*Verrucaditha*, *Ditha*, and *Comsaditha*). In addition, *Heterolophus* and *Megathis* were doubtfully referred to the group. *Tridenchthonius* was still considered a true Chthoniid.

Without giving any reasons for his decision or presenting any data to justify the change, Beier in 1932 reduced the group to subfamily status (*Dithinae*), but almost immediately, in another but slightly later publication (again without discussion), he recognized it as of valid family rank (*Dithidae*). Roewer in 1937, in the most recent published synopsis (entirely a compilation), has agreed in recognizing the group as of valid family rank (under the name *Dithidae*).

With the generic additions and changes proposed by Beier, the family by the end of 1942 had come to include ten generic names, including one recognized generic "synonym." The genus *Megathis* Stecker, doubtfully referred here by Chamberlin in 1929 (l.c.), was tentatively removed to the *Chthoniidae* by Beier (1932, l.c., p. 69). The probabilities are that this • genus will be indefinitely listed as unrecognizable. The genital structures appear to be of great uniformity in apparent structure throughout the family and do not, unfortunately, show much promise of being of significant usefulness either in the definition of genera or species. This point should, however, receive more detailed study than we have been able to give it.

As reviewed here, the family comprises 2 subfamilies, 2 tribes, 14 genera, and 30 species. One new subfamily, the *Cecodithinae*, and five new genera, *Xenoditha*, *Sororoditha*, *Cryptoditha*, *Anisoditha* and *Dithella*, are here proposed, while the type genus *Tridenchthonius* is redefined. The genus *Afroditha* Beier, later improperly synonymized by its author with *Ditha* Chamberlin, is here regarded as a synonym of *Tridenchthonius*.

GENERIC CHARACTERS. The characters required for the discrimination of genera in this group are minute and difficult to ascertain without careful

dissection and clearing. This is especially true of the intercoxal tubercle and the dentition and chaetotaxy of the chela. Without precise knowledge of these characters it is nearly or quite impossible to recognize surely or to differentiate the various genera. Other characters of importance in the generic classification of this family are the chaetotaxy of the carapace and abdomen, the tactile setae on the fourth tarsus, the number and disposition of pseudotactile setae on the abdomen, the shape and relative robustness of the vestitural setae, the sculpturation of the derm (especially of the carapace and palps), and the presence and development of the eyes.

The genital structures appear to be of great uniformity in apparent structure throughout the family and do not, unfortunately, show much promise of being of significant usefulness either in the definition of genera or species. This point should, however, receive more detailed study than we have been able to give it.

In the following generic diagnoses, characters are itemized roughly in order of apparent relative importance. It is desired to emphasize the importance of recording all characters that have been proved to be of generic value, as well as unique features, in characterizing as yet unknown or undiscriminated genera.

Consideration of the following generic diagnoses will show that, all too often, the nature of important characters is necessarily omitted because of the inadequacy of original descriptions. Lacking material to supplement such descriptions, it is often impossible to form a satisfactory opinion as to the validity and relationships of a given genus. The mere fact that certain characters are not especially different from those of a related group is not sufficient to justify their omission from an original description.

KEY TO THE INCLUDED GENERA.

1. Coxal spines absent from coxae I and II; adult with a simple galea (spinneret); setae IB and ISB nearly median on the dorsum of the hand (fig. 17) (Subfamily Cecodithinae nov.), the only included genus from Argentina.....14. *Cecoditha* Mello-Leitao (p)
- Coxal spines present on coxae I and II; galeate spinneret lacking in adults (present in multiple form in nymphal stages as far as known); setae IB and ISB distinctly subbasal on the dorsum of the hand (fig. 2, J) (Subfamily Tridenchthoniinae Hansen).....2
2. (1) Marginal teeth of chela relatively sparse, acute, prominent and distinctly spaced anteriorly on fixed finger at least (fig. 2, D) (Tribe *Verrucadithini* Chamberlin).....3
- Marginal teeth of chela truncate or retruncate and closely contiguous on both fixed and movable fingers (fig. 2, E) (Tribe *Tridenchthoniini* nom. nov.).....8
3. (2) Movable finger "devoid" of teeth, or if present they are relatively obscure, broad, rounded, and definitely contiguous (fig. 2, C).....4
- Not so, movable finger with prominent, acute, and well-spaced teeth distally at least.....5
4. (3) Carapace, tergites, and palps granular or asperate; carapace strongly emarginate, with numerous (70 or more) prominent lanceolate setae which occur on large tubercles; tergites irregularly biseriate; epistomal process absent; broad, but distinct, contiguous teeth on movable finger of the chela; (DS and ET closely associated—latter much closer to DS than to IT; seta ST slightly but distinctly closer to T than to SB; from southeastern United States).....3. *Verrucaditha* Chamberlin, p.....
- Carapace and palps smooth; carapace with a relatively sparse vestiture of setae (prob-

- ably 40 or fewer); anterior margin of carapace nearly transverse (not prominently emarginate) and with a distinct epistomal process; teeth completely (?) lacking on the movable finger; (chaetotaxy of finger of chela not as yet known); South American genus4. *Anisoditha*, gen. nov. (p.....)
5. (3) Chela in lateral profile distinctly aberrant—either with a pronounced but rounded dorsal expansion immediately distad of setae IB and ISB (in which case the proximal portion of the movable finger is also provided with an irregularly serrate dental lamella rather than distinct teeth) (fig. 3) or there is a very abrupt and sharp depression in the profile distad of median and proximad of the base of the fingers (fig. 4).....6
Chela in lateral profile normal, only gently rounded or nearly "straight" distad of setae IB and ISB—movable finger with the usual marginal teeth which are not fused into a basal dental lamella7
6. (5) Accessory seta DS isolated; seta ET closer to IT than to DS and closely associated with IT and EST to form a distinctive, subdistal, triangular cluster; dorsum of hand not abruptly depressed distad of median and proximad of the finger base (fig. 3); African genus.....1. *Xenoditha*, gen. nov. (p.....)
Seta ET about one areolar diameter caudad of DS and much closer thereto than to IT; IT and EST median and not grouped with ET; dorsum of hand in both sexes abruptly depressed distad of median and proximad of the finger base (fig. 4, A, B); African genus.....2. *Verrucadithella* Beier (p.....)
7. (5) Vestitural setae abundant (probably totaling in excess of 50 or 60 at least, on carapace); tergites definitely and irregularly biseriate (probably 10 or 12 setae in both discal and marginal series); from Brazil.....5. *Sororoditha*, gen. nov. (p.....)
Vestitural setae sparse (carapace with a total of about 28); tergites uniseriate (about six marginal setae per segment); from Brazil.....8. *Cryptoditha*, gen. nov. (p.....)
8. (2) Setae ST and SB of chela submedian, contiguous or subcontiguous (at most one areolar diameter apart) (figs. 11, A, 12, A).....9
Setae ST and SB of chela clearly not contiguous; T, ST, and SB well separated from one another (figs. 7, 8, 9, 10, A).....10
9. (8) Setae ST and SB slightly distad of median, the distance between B and SB greater than that between T and the finger tip; carapace weakly to distinctly emarginate and with a distinct transverse furrow which delimits a narrow, tergite-like posterior carapacial disc, with numerous setae (70 or more, generally the latter); tergites distinctly biseriate, at least in the female; chelicerae with 6-9 accessory setae; from Mexico, South America and Africa.....12. *Tridenchthonius* Balzan (p.....)
Setae SB and ST slightly proximad of median, the distance between B and SB less than that between T and the finger tip; carapace not at all emarginate (in orthotype), lacking a transverse furrow and bearing relatively few setae (80 or fewer; about 50 in orthotype); tergites uniseriate; chelicerae with about 4 accessory setae (in orthotype); from the Philippine Islands, West Africa, and Paraguay.....13. *Compsaditha* Chamberlin (p.....)
10. (8) Seta B of movable finger subbasal rather than basal; the distance from B to SB distinctly less than twice the distance between B and the finger base; fossil genus from the Baltic amber.....7. *Chelignathus* Menge (p.....)
Seta B distinctly basal; the distance between B and SB distinctly more than twice the distance from B to the finger base; living genera.....11
11. (10) Intercoxal tubercle present; tergites usually biseriate.....12
Intercoxal tubercle absent; tergites uniseriate or at most obscurely biseriate; from Brazil, Sumatra, and South Africa.....8. *Heterolophus* (Tomosvary) (p.....)
12. (11) Carapace granulate or "coarsely and reticulately sculptured" (teste Beier); with four large eyes; posterior pair about as well developed as the anterior pair; tergites distinctly biseriate; African genus.....9. *Paraditha* Beier (p.....)
Carapace smooth but prominently tessellate or even finely hispid; generally with four eyes, but posterior pair tending toward reduction—very weakly developed to vestigial or absent in some species; Southern Asiatic forms.....13
13. (12) Carapace with a distinct epistomal emargination and a more or less distinct posterior transverse furrow delimiting a very narrow, tergite-like posterior disc; carapace with 70-100 robust setae; tergites prominently biseriate; from Dutch East Indies and Philippine Islands.....10. *Ditha* Chamberlin (p.....)
Carapace lacking epistomal emargination or transverse furrow and bearing about 40 relatively slender, acuminate setae; tergites evenly uniseriate; from Java.....11. *Dithella* gen. nov. (p.....)

1. Subfamily TRIDENCHTHONIINAE Hansen

1894. *Tridenchthoniinae* Hansen, Ent. Meddel. Ent. Foren. Copenhagen. 4:3-5; 230 and 232.

BIBLIOGRAPHY. All other references cited under the family heading (q.v.) actually refer to the typical subfamily as well. The subfamily limits recognized are here defined for the first time in contra-distinction to those of the subfamily Cecodithinae nov.

DIAGNOSIS. Coxal spines invariably present on pedal coxae I and II (figs. 11C, 15-H, I, J, K, O and 16-B). Setae IB and ISB distinctly basal or subbasal in position on dorsum of hand (figs. 1-16 incl.). Chelicerae lacking a galea in the adult (figs. 1, 4-C, 5-G, 10-B, 11-A, 12-B, 13-B and 15-B). Chelicerae of nymphal stages possessing multiple simple galeae in some species at least (figs. 14-F and 15-F).

REMARKS. The subfamily and its included tribes and genera have been segregated in the preceding key.

The geographical range of the typical subfamily is coincident with that of the family as a whole.

1. Tribe VERRUCADITHIINI Chamberlin

1929. *Verrucadithini* Chamberlin, Ann. and Mag. Nat. Hist. Ser. 10:4:59.

DIAGNOSIS. Marginal teeth of chela, at least of the fixed finger, well spaced and acute, in part at least (fig. 2, D). Generally with all four eyes large and well developed (fig. 4, E). Thus far no genus assigned to this group is known to possess an intercoxal tubercle.

REMARKS. Six genera are here assigned to this group, two of which are of somewhat doubtful status. Three of the genera are South American, one is North American, and two are African.

1. Genus XENODITHA,³ nov.

ORTHOTYPE: *Verrucadithella mordax* (Tullgren) Beier.

DIAGNOSIS. Marginal teeth of chela acute and distinctly spaced on the distal half of both fingers; tending to become progressively smaller and contiguous on the base of the fixed finger and fused into an irregularly serrate lamella on the base of the movable finger (fig. 3).

Chaetotaxy of chela as illustrated (fig. 3); DS subterminal and further distad of ET than ET is of EST; ET, IT, and EST subterminal and forming a compact, equilaterally triangular cluster; IST, ESB, and EB forming an oblique basal series, with ESB closer to EB than to IST; setae T, ST, and SB slightly distad of median; ST slightly closer to T than to SB; seta B basal and more than three times as far caudad of SB as it is distad of the finger base.

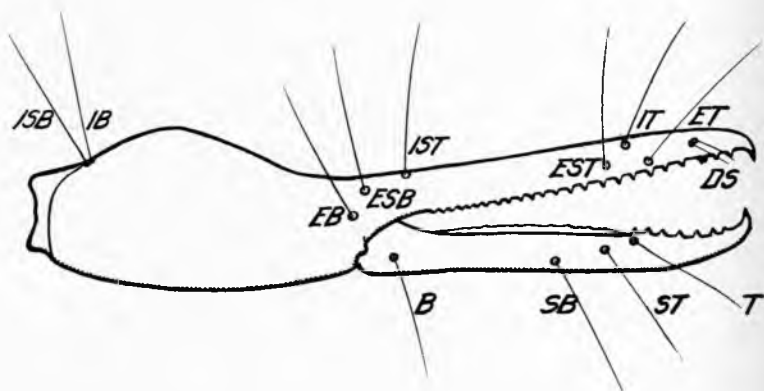
Chela in dorsal aspect of normal appearance; nearly so in lateral aspect, except that it is dorsally more "swollen" than usual just distad of

³Greek *xenos*, strange, + *Ditha*.

FIGURE 3.

Xenoditha mordax (Tullgren)

Exterior lateral aspect of right chela (From Beier 1932, modified).



setae IB and ISB; dorsal contour, in profile, smoothly curved—not with a sudden, marked depression distad of median (fig. 3).

Carapace emarginate and with a serrate epistomal process; granulate or “coarsely, reticulately sculptured”; with four prominent and nearly equally developed eyes; with a relatively sparse vestiture of robust setae (about 26). Tergites uniseriate and numbering about six on the median segments. Vestitural setae described by Beier as “robust” and figured by Tullgren as definitely lanceolate.

Coxal spines occur on coxae I and II and number three to four per coxa. They are figured by Tullgren (in the orthotype) as individually, broadly clavate and deeply incised.

Intercoxal tubercle absent.

Chaetotaxy of chelicera unknown.

Presence or nature of tactile setae on the fourth tarsus or abdomen unknown.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Known only from the orthotype, which was originally described from Natal and Zululand and subsequently recorded from various localities in South Africa near Cape-town.

REMARKS. It is not known whether Beier’s redescription of the orthotype, upon which the foregoing diagnosis is largely based, is from Tullgren’s type material or was part of the subsequently identified material (Ellingsen’s determination) from South Africa. The generic characters are very distinctive.

1. *Xenoditha mordax*⁴ (Tullgren)

FIGURE 3.

1907. *Chthonius mordax* Tullgren. Zoolog. Stud. tillagn. Tullberg, 234; f. 12a-d (Pedipalp; movable finger of chelicera; chela and individual coxal spine, respectively).

1912. *Chthonius mordax* Tullgren, Ellingsen, Ann. South African Mus. 10:(4):89 and 122.

1932. *Verrucadithella mordax* (Tullgren) Beier, Das Tierreich. 57:33; f. 39 (chela).

⁴Latin *mordax*, biting or snappish.

OCCURRENCE. Tullgren (l.c.) records the species from Natal (Caversham and Stamford Hill, under leaves) and Zululand (Lake Sibayi). Ellingsen (l.c.) records the species from: Cape of Good Hope (Cape Province at Table Mountain near Platteklip and at its foot); above Klaassenbosch; Signal Hill; Kalk Bay; Camp's Bay; King Williams Town Div.; Pirie. Stated to be quite common and abundant in South Africa (Ellingsen l.c.). Females were recorded as bearing from four to nine developing larvae, the average number being seven.

2. Genus VERRUCADITHELLA⁵ Beier

1931. *Verrucadithella* Beier, Zool. Anz. 93:51.

1932. *Verrucadithella* Beier, Beier, Das Tierreich. 57:32.

1937. *Verrucadithella* Beier, Roewer, Bronn's Klass. u. Ord. des Tierreichs, 5:(4:6):235.

FIGURE 4.

Verrucadithella dilatimanus (Redikorzev).

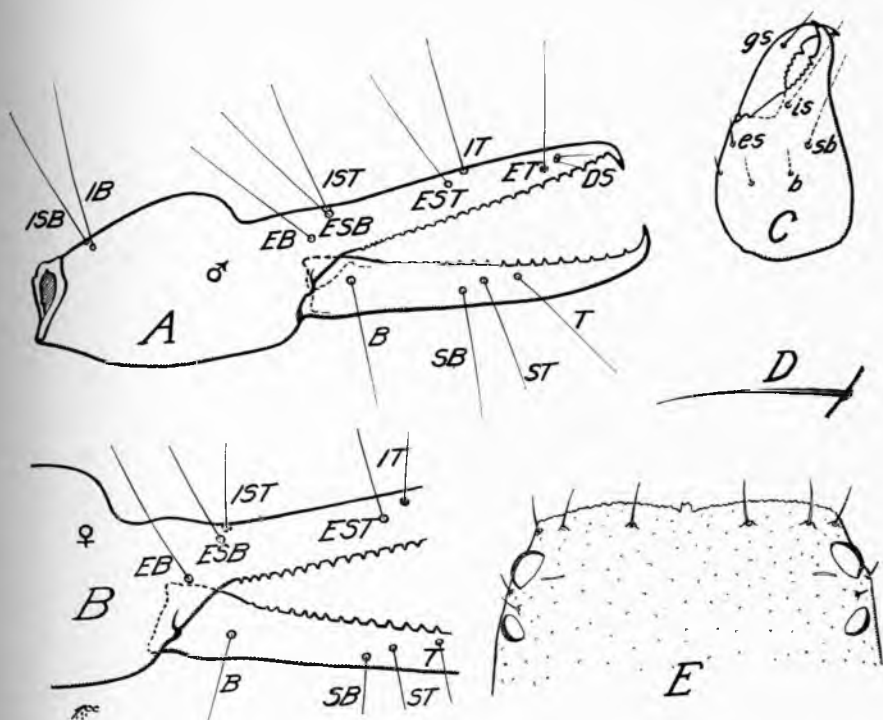
A—Exterior lateral aspect of male chela.

B—Exterior lateral aspect of base of female chela. (Same scale as fig. A).

C—Dorso-lateral aspect of male chelicera. (Serrulae omitted).

D—Acuminate vestitural seta from tibia of leg IV (female).

E—Anterior portion of carapace of male showing eyes, epistomal margin and granulation. (Drawn from "cotypes" of male and female, JC-908.01002 and 1, respectively.)



⁵Diminutive of *Verrucaditha* q.v.

ORTHOTYPE. *Chthonius dilatimanus* Redikorzev.

REMARKS. Although it seems very probable that only one species is involved, there are some points of possibly significant difference between Tullgren's and Beier's descriptions. Thus Beier merely mentions the vestitural setae, while Tullgren describes and figures them as prominently lanceolate (as in *Verrucaditha*). Beier merely described the coxal spines as present on coxa I and II (as is usual). Tullgren, however, (l.c., fig. 12, D) figures and describes them as individually, broadly clavate and deeply incised. This development is unusual in this family and it seems curious that Beier did not record this characteristic. Tullgren's figure of the chela (l.c., fig. 12, C) is definitely erroneous as far as the chaetotaxy is concerned.

DIAGNOSIS. Marginal teeth of chela prominent, sharply acuminate on both fingers; subequally developed on both fingers, basally and distally.

Chaetotaxy of chela as illustrated (fig. 4, A, B); seta ET subterminal and about one areolar diameter caudad of seta DS; EST and IT very slightly distad of median, IT only slightly distad of EST (less than 2 areolar diameters); IST, ESB, and EB basal on the fingers with setae ESB and IST closely adjacent (opposite) and distad of EB; setae T, ST, and SB about median; subequally spaced or with ST slightly closer to SB than T; B basal and at least twice as far caudad of SB as distad of the finger base.

Hand of chela in dorsal aspect normal; in lateral profile, with a very abrupt and distinctive depression distad of median and proximad of the finger base (fig. 4, A, B).

Carapace anteriorly emarginate and with a dentate epistomal process; no trace of a posterior furrow; weakly granulate or roughened with minute, scattered papillae; with four prominent and nearly equally developed eyes (fig. 4, E); with a relatively sparse vestiture (about 30 in all) of rather slender, acuminate setae (fig. 4, D, E) which are relatively inconspicuous; tergites uniseriate, bearing a marginal series of 8-12 setae.

Coxal spines occurring on coxae I and II; the individual blades acuminate, contiguous, and numbering about four on each coxa; each arising from a small, elevated and rounded base.

Intercoxal tubercle absent.

Chelicera with two accessory setae only (fig. 4, C).

Metatarsus IV with a slender, submedian, tactile seta; presence of tactile seta on telotarsus not ascertainable with certainty, but probably a submedian one occurs.

Eleventh abdominal segment with a dorsal and ventral pair of moderately differentiated pseudotactile setae.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Includes two species—the orthotype, *V. dilatimanus*, known thus far only from a single collection

taken in "tropical East Africa" (Tanganyika?), and *V. jeanneli*, from two localities on Mt. Elgon (Uganda).

REMARKS. The two included species may be separated by means of the following key.

KEY TO SPECIES OF VERRUCADITHELLA

1. Dorsum of chela caudad of the predigital depression convex; seta ST clearly closer to SB than to T.....*dilatimanus* (Redikorzev)
- Dorsum of chela caudad of the predigital depression flat, its contour almost parallel with the nearly straight ventral contour; seta ST equidistant between SB and T.....*jeanneli* (Beier)

1. *Verrucadithella dilatimanus*⁶ (Redikorzev)

FIGURE 4.

1924. *Chthonius dilatimanus* Redikorzev, Rev. Russe d' Etom. 18:193; tf. 7, 8, and 9 (dorsal aspect entire animal, chelicera, and chela).

1932. *Verrucadithella dilatimana* (Redikorzev), Beier. Das Tierreich, 57:33; tf. 38 (chela).

DIAGNOSIS (addenda). The following palpal proportions are here presented as of supplementary value in the definition of the species (that of male first, then female): Femur 3.67-3.83 times as long as broad and 2.01-1.93 times as long as tibia; tibia 1.77-1.89 times as long as broad; chela 1.46-1.39 times as long as femur and 3.78-3.66 times as long as broad; fingers 1.27-1.24 times as long as hand.

MEASUREMENTS (mm.). Male: (Cotype JC-908.01002). Total length 1.28. Greatest abdominal breadth 0.61. Carapace 0.43 long; 0.46 broad across eyes, and 0.54 broad posteriorly. Palps: Trochanter indet.; femur 0.51 x 0.139; tibia 0.25 x 0.143; chela 0.74 x 0.20 (greatest depth 0.213; depth at base of fingers 0.154); hand 0.33 long; fingers 0.41 long.

Female: (Cotype JC-908.01001). Total length 1.85. Palps: Trochanter 0.30 x 0.16; femur 0.66 x 0.17; tibia 0.34 x 0.18; chela 0.92 x 0.25 (greatest depth 0.28; depth at base of fingers 0.19); hand 0.41 long; fingers 0.51 long.

OCCURRENCE. Known only from the type collection of which we have examined a male and female (JC-908.01001-2) secured by exchange from Redikorzev. Beier undoubtedly secured his material from the same source.

The specimens of the type collection were taken under the leaves of bamboo and under lichens on trees at "Molo in East Africa," June and July of 1914 (probably Tanganyika). Two females of this type lot carried seven developing larvae each, while one carried nine.

Redikorzev's figure of the chela (l.c. fig. 9) is erroneous, as far as the distribution of the tactile setae of the fixed finger is concerned. Also his figure of the carapace does not show the median emargination evident in the specimens examined by us.

⁶Latin *dilatus*, dilated, + *manus*, hand.

2. *Verrucadithella jeanneli*[†] Beier

1935. *V. jeanneli* Beier, Miss. Scient. de L'Omo. Mus. d'Hist. Nat. Paris. 2:(6):117, ff. 1(chela).

OCCURRENCE. The type collection was from Mt. Elgon, valley of Koptawelil, at an elevation of 2,300 meters, while additional material was collected at "Camp II de l'Elgon," at 2,470 meters elevation. Uganda, near the Kenya border north of Lake Victoria.

3. Genus *VERRUCADITHA*[§] Chamberlin

FIGURE 5.

1926. *Alura*[¶] (non *Alura* Moschler 1884). Chamberlin, Vid. Meddel. Dansk. nat. foren. 81:334.
1929. *Verrucaditha* Chamberlin, for *Alura* Chamberlin, Ann. and Mag. Nat. Hist. ser. 10, 4:59. (New name to eliminate homonymy.)
1931. *Verrucaditha* Chamberlin, Chamberlin, The Chelonethida, pp. 194 and 210. Figs.
1932. *Verrucaditha* Chamberlin, Beier, Das Tierreich, 57:31.
1937. *Verrucaditha* Chamberlin, Roewer, Bronns Klass. und Ord. des Tierreichs, 5:(4:6): 235.

ORTHOTYPE. *Chthonius spinosus* Banks.

DIAGNOSIS. Palps granular; marginal teeth of chela acute and distinctly spaced distally on the fixed finger, but smaller and nearly contiguous basally; teeth of movable finger large, rounded and contiguous throughout (fig. 5, A, F).

Chaetotaxy of chela as illustrated (fig. 5, A, F); DS and ET closely proximate and subterminal; IT and EST both distinctly distad of median and separated by about two areolar diameters; IST, ESB, and EB forming an oblique basal series with ESB closer to IST than to EB. SB median and in series with ST and T, the three setae subequally spaced (two to three areolar diameters apart); B basal and about three times as far from SB as from the finger base.

Chela normal in contour from both dorsal and lateral aspects (fig. 5 A, B).

Carapace pronouncedly emarginate; median epistomal process absent or vestigial; posteriorly with a distinct but inconspicuous transverse depression or furrow which delineates a very narrow posterior disc (about as in fig. 13, F); distinctly granulate or hispid; with four prominent eyes which are subequally developed; with an abundant vestiture of large and distinctly lanceolate setae (fig. 5, H) which generally arise from larger granules and total 80 to more than 100. Tergites strongly but irregularly biseriate; with 6 to 12 lanceolate setae in the discal and 14 to 18 in the marginal series per tergite.

[†]Named in honor of Dr. R. Jeannel, French zoologist.

[§]Latin *verruca*, warty, + *Ditha*.

[¶]An anagram of the name Laura.

FIGURE 5.

Verrucaditha spinosa (Banks).

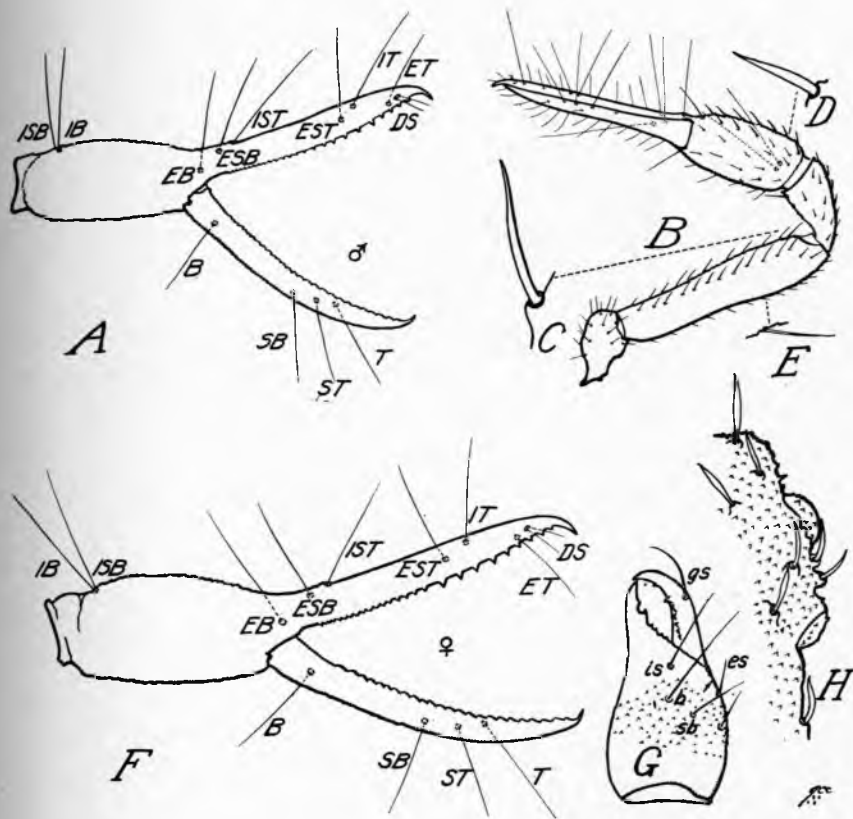
A—Interior lateral aspect of left male chela (JC-741.01001.)

B, C, D, and E—Ventral aspect of left pedipalp with inserts showing form of vestitural setae (Female, JC-292.01002).

F—Interior lateral aspect of left female chela (Female, JC-286.01001) (Same scale as fig. A).

G—Exterior lateral aspect of right chelicera (serrulae omitted). (Male, JC-740.01001).

H—Eyes and adjacent portions of carapace showing granulation which extends even to the cornea of the eyes (Female, JC-730.01001).



Coxal spines of the usual type on coxae I and II; small with minute terminal denticulations or incisions and numbering about 4 per coxa.

Intercoxal tubercle absent.

Chelicera with one accessory seta and lacking a differentiated spinneret (fig. 5, G).

Metatarsus and telotarsus IV, as well as the abdomen, lacking pseudo-tactile setae.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Two "species" have been definitely assigned to this genus and Beier (l.c.) has doubtfully referred two additional species (*Chthonius hirsutus* Balzan and *Chthonius curvidigitatus* Balzan) to this group. These two latter species undoubtedly pertain to the tribe Verrucadithiini, but in our opinion represent two distinct genera which are here described as *Sororoditha* and *Anisoditha*, respectively.

The two "remaining species" (the type, *V. spinosa* (Banks) and *V. megaloptera* (Chamberlin)) cannot be maintained apart and are here synonymized. This leaves Verrucaditha a monotypic genus.

1. *Verrucaditha spinosa*¹⁰ (Banks)

FIGURES 2, B, C, D, H, I; 5, A, H.

1893. *Chthonius spinosus* Banks, Canad. Ent. 25:67.
 1895. *Chthonius spinosus* Banks, Banks J1. N. Y. Ent. Soc. 3:13. (Listed only. No new records.)
 1908. *Chthonius spinosus* Banks, Coolidge, Psyche, :114. (Listed only. No new data.)
 1913. *Chthonius spinosus* Banks, Comstock. The Spider Book First Ed. p. 52 (In key).
 1926. *Alura spinosa* (Banks), Chamberlin, Vidensk. Meddel. Dansk. nat. Foren. 81:334. (Noted only.)
 1929. *Verrucaditha spinosa* (Banks), Chamberlin Ann. Mag. Nat. Hist. ser. 10, 4:59, figs. 1 C and 2 H (carapace and eyes and anterior margin of carapace).
 1929. *Verrucaditha megaloptera* Chamberlin, Ann. Mag. Hist. ser. 10, 4:59.
 1931. *Verrucaditha spinosa* (Banks), *V. megaloptera*, Chamberlin, Chamberlin, The Chelonethida: figs. 11E, M (p. 52); 16A (p. 73); 22 D, E, F (p. 97); 23 G (p. 98); 25 B, C, H (p. 102); 47 Y (p. 177) (anterior carapacial margin and eyes; chelicera; pharyngeal pump; oral structure; maxillae and rostrum and vestitural seta, respectively).
 1932. *Verrucaditha spinosa* (Banks), *V. megaloptera* Chamberlin, Beier Das. Tierreich, 57:31 and 32.
 1937. *Verrucaditha spinosa* (Banks), *V. megaloptera* Chamberlin, Roewer, Bronns. Klass. und Ord. des Tierreichs. 5:(4:6):235.

DIAGNOSIS (emended). Carapace, tergites, and palps extremely rugose or granular (hispid) and with an abundant vestiture of robust and nearly lanceolate setae (fig. 5, B, D); the granulations extending even to the cornea of the eyes, especially on the posterior pair, which are markedly hispid (fig. 5, H). Chaetotaxy of carapace 8 to 12-6 to 10 (74-120) and varying to some extent with the sex, being in general fewer in the male. In addition the carapace seems somewhat less granular in the female. Carapace quadrate, broadest posteriorly (may possibly be broadest medially, in the male) and broader behind than long. Tergal chaetotaxy irregularly biseriate, in male:

$$8: \frac{2\pm}{10\pm} : \frac{2}{10} : \frac{4}{10} : \frac{4}{10} : \frac{6}{10} : \frac{6}{10} : \frac{4}{10} ;$$

in female:

$$\frac{12-15}{14-16} : \frac{6-8}{14-18} : \frac{10-14}{16} : \frac{12-14}{16}$$

¹⁰Latin, *spinosus*, thorny or prickly.

Sternal chaetotaxy (starting with segment 4) male: 8:8:8:8:10:10:12; female: 6-8:8:8:10-12:10-12:10-14:10-14. The fourth to seventh or eighth sternites bearing lightly sclerotic but widely separated scuta. Palps as shown in fig. 5, B. Chaetotaxy and dentition of chela as illustrated (fig. 5, A, F); the marginal teeth of either fingers numbering approximately 30-32. Coxae I with a meso-anterior spine (fig. 2, B). Dentition and chaetotaxy of chelicera as shown in fig. 5, G. Appearance of male genital structure as shown in fig. 2, H, I.

PALPAL PROPORTIONS. Both sexes: Trochanter 1.5-1.7 times as long as broad; femur 4.4-4.7 times as long as broad; tibia 2.0-2.2 times as long as broad; chela 1.41-1.49 times as long as femur and 5.2-5.4 times as long as broad—more slender in the male than in the female; fingers 1.5-1.6 times as long as the hand, which is nearly cylindrical and as deep as broad. Femur longer than carapace, which, in turn, is longer than the fingers.

MEASUREMENTS (mm.). Male (JC-741-01001). Total length 1.21. Carapace 0.46 long. Palps: Trochanter 0.158 x 0.092; femur 0.440 x 0.099; tibia 0.210 x 0.096; chela 0.631 x 0.118 (0.117 deep); hand 0.246 long; fingers 0.389 long. Female (JC-286.01001 and 730.01001). Total length 1.26-1.25; abdominal breadth 0.59-0.55. Carapace 0.52-0.51 long; 0.45-0.42 broad across eyes and 0.55-0.46 broad across posterior margin. Palps: trochanter 0.190-0.180 x 0.119-0.107; femur 0.549-0.541 x 0.120-0.114; tibia 0.262-0.238 x 0.118-0.113; chela 0.776-0.768 x 0.149-0.148 (depth 0.152-0.146); hand 0.312 long; fingers 0.467-0.459 long.

GEOGRAPHICAL RANGE.

Previous distributional records. The type locality of the species is Citrus County, Florida, where it was noted as "common" (Banks 1893 l.c.). Subsequently Chamberlin (1929 l.c.) recorded it from Lake Poinsette, Florida, and under the name of *V. megaloptera* from Bloomington and Winona Lake, Indiana (where it was collected from wet or damp oak logs and a beech stump). A representative was also recorded from Ohio.

New material examined. Florida: One male (JC-741.01001) coll. Dec. 15-Jan. 8, 1925-26 at Dunedin by Dr. W. S. Blatchley. One female (JC-740.01001) coll. April 4, 1927, at Ancilla by "Walker." One female (JC-721.01001) coll. Feb. 3, 1924, in decaying log in swamp at Gainesville by Prof. Hubbell. North Carolina: Two females (JC-1253.01001-2), Durham, under bark of oak, coll. June 27, 1937 by Dr. H. E. Savely. Mississippi: One female (JC-730.01001) coll. at Lucedale by Dietrich in Feb., 1931.

REMARKS. It has been proved that nearly all the characters upon which *V. megaloptera* were based are bridged by intermediates, and while extremes are readily recognized, it is very doubtful that they are sufficiently distinct to justify recognition of more than a single species. The known range of this species, as here considered, is from Ohio and Indiana to Mississippi and Florida.

4. Genus *ANISODITHA*¹¹ nov.

ORTHOtype: *Chthonius curvidigitatus* Balzan.

DIAGNOSIS. Marginal teeth of chela large, well separated, and re-curved on the fixed finger and apparently nearly as well developed basally as distally; teeth entirely "lacking" from the movable finger, even anteriorly.

Chaetotaxy of chela unknown except for IB and ISB, which, as usual in the Tridenchthoniidae, are closely proximate (about one areolar diameter apart) and distinctly basal in position.

Chela normal in dorsal and lateral aspect; without special modification of the hand. Slightly heterodigitate and with fingers curved and not contiguous along dental margin when chela is closed.

Anterior carapacial margin nearly transverse—not significantly emarginate (if at all) and provided with a dentate epistomal process; with four prominent eyes, of which the posterior pair is only a little less developed than the anterior pair; with a relatively sparse vestiture (probably less than 40-50 in all) of short, acuminate setae. Tergites uniseriate.

No knowledge is available on the presence or absence of the coxal spines, the intercoxal tubercle, or tactile setae of the tarsus. The chelicera bears at least two accessory setae and lacks a differentiated spinneret; movable finger provided with "many small denticles." The tip of the abdomen possibly possesses a few pseudotactile setae.

GEOGRAPHICAL RANGE. Only the orthotype is at present known. It has been recorded only from Rio Apa, Paraguay.

REMARKS. This genus is erected for the reception of *Chthonius curvidigitatus* Balzan, which was dubiously assigned to *Verrucaditha* by Beier (1932, *Das Tierreich*, 57:32). While inadequately described, according to present standards, enough characters are known to make it certain that it is a member of the tribe Verrucadithiini and not a member of any of the more adequately described genera.

The genus seems closest to *Verrucaditha*, which it resembles in the reduced dentition of the movable finger. It differs markedly from this genus, however, in the nonlanceolate character of the setae, in lacking a pronounced emargination of the carapace, in possessing a well-developed epistomal process, and in being smooth rather than distinctly granulate or hispid.

1. *Anisoditha curvidigitata*¹² (Balzan)

1890. *Chthonius curvidigitatus* Balzan, *Ann. Mus. civ. Stor. nat. di Genova*, Ser. 2, 9:449, pl. 17, f. 27 (dorsal aspect entire animal) and 27a (tip of fingers of chela showing dentition).

1891. *Chthonius curvidigitatus* Balzan, Balzan, *Ann. Soc. ent. Fr.* 60:550.

1932. *Verrucaditha curvidigitata* (Balzan) Beier, *Das Tierreich*, 57:32.

DIAGNOSIS. (Based on Balzan's description and figures. Carapace

¹¹Greek *a-* not; *isos-* equal + *Ditha*. Refers to the unequal dentition on the fingers of the chela.

¹²Latin *curvus*, a curve; *digitus*, finger.

smooth and subquadrate, a little longer than broad; with prominent setae which, however, number less than 40 (judging from Balzan's figure). Anterior carapacial margin nearly transverse and provided with a dentate epistomal process (shown in figure). Tergites smooth and apparently uniseriate (judging from the illustration). Balzan states, however, in his text, that the tergites are provided with setae "as in the preceding species" (i.e., "*Chthonius hirsutus*" (= *Sororoditha hirsutus*), which he described as definitely biseriate).

Palps of normal facies, the femur 2.2-2.3 times as long as the tibia and 5.1-5.2 times as long as broad; tibia twice as long as broad; the chela 1.34 times as long as the femur and 5.0 times as long as broad; fingers 1.8 times as long as the hand, which is 1.76 times as long as broad (derived from Balzan's measurements of 1891).

MEASUREMENTS. (mm.) (Balzan 1891.) Sex unknown. Total length 1.45. Abdominal breadth 0.575. Carapace 0.405 x 0.390. Palps: Femur 0.465 x 0.090; tibia 0.205 x 0.100; chela 0.625 x 0.125; hand 0.220 long; fingers 0.405 long.

REMARKS. Known only from the type collection (two specimens from Rio Apa Paraguay)). Collected from dry, fallen leaves in the forest ("sotto le foglie cadute e secche dei boschi").

5. Genus SORORODITHA¹³ nov.

ORTHOTYPE: *Chthonius hirsutus* Balzan.

DIAGNOSIS. Marginal teeth of chela large, acute, and well spaced; nearly as well developed on the movable as on the fixed finger. Not known whether or not they tend to be reduced or contiguous basally.

Chaetotaxy of chela unknown except for setae IB and ISB, which, as usual in the family, are nearly contiguous (about one areolar diameter apart) and distinctly basal on the hand.

Chela of normal facies; no unusual modifications of either hand or fingers.

Carapace smooth ("liscio"), subquadrate, not emarginate, and with a well-developed epistomal process; with four subequally developed, prominent eyes. With a relatively abundant (probably 60-100 or more) vestiture of robust, acuminate setae. Tergites smooth, irregularly biseriate, probably numbering about 10-12 in both discal and marginal series, at least on the median segments.

There is no knowledge available as to the presence or absence of coxal spines or the intercoxal tubercle.

Chelicera with seven or eight accessory setae (according to Balzan's figure) and lacking a differentiated spinneret; movable finger with five denticles.

¹³Latin *soror*, sister + *Ditha*.

Pseudotactile setae are absent from the fourth tarsus and the tip of the abdomen, according to Balzan's illustration of the orthotype, but this should not be regarded as certain.

GEOGRAPHICAL RANGE. Known from the orthotype which has thus far been recorded only from Matto Grosso, Brazil.

REMARKS. This genus is erected for the reception of *Chthonius hirsutus* Balzan which was dubiously referred to *Verrucaditha* by Beier in 1932 (Das Tierreich, 57:32). It is certainly a member of the tribe Verrucadithiini, but possesses a combination of characters which do not permit its assignment to any of the other genera here recognized. It seems closest to *Cryptoditha*, but differs in the more abundant vestiture of setae and in the biseriate tergal chaetotaxy.

1. *Sororoditha hirsuta*¹⁴ (Balzan)

1890. *Chthonius hirsutus* Balzan, Ann. Mus. civ. Stor. nat. Ser. 2, 9:448: pl. 17, fig. 26 (dorsal aspect entire animal) and 26a (tip of fingers of chela showing dentition).

1891. *Chthonius hirsutus* Balzan, Balzan, Ann. Soc. ent. Fr. 60:550.

1932. *Verrucaditha hirsuta* (Balzan) Beier, Das Tierreich, 57:32.

DIAGNOSIS. (Drawn from Balzan's account and illustrations, q. v.). Carapace smooth, slightly longer than broad; vestitured with "many setae" which, judging from the illustration, number distinctly more than 50. Four well-developed eyes. Anterior carapacial margin transverse and with a distinct epistomal process (from figure). Tergites smooth and irregularly biseriate; judging from the figure, these number at least 12 in both marginal and discal series. Movable finger of the chelicera with 5 teeth.

Palps relatively slender; femur 1.7 times as long as tibia and 4.7 times as long as broad; tibia 2.2-2.3 times as long as broad; chela 1.6 times as long as femur and 4.9-5.0 times as long as broad; fingers 1.48 times as long as hand; hand twice as long as broad (derived from Balzan's measurements of 1891).

MEASUREMENTS. (mm.) (Balzan 1891.) Sex unknown. Total length 1.60. Carapace 0.470 long and 0.465 broad. Abdomen 0.615 broad. Palps: Femur 0.520 x 0.110; tibia 0.305 x 0.135; chela $0.820 \pm$ x 0.165; hand 0.330 long; fingers 0.490 long.

REMARKS. Known only from the type collection which was recorded merely as from "Matto-grossa," a province in Brazil. Balzan's description and illustration are excellent for the time, and little difficulty should be had in recognizing this species providing it comes from the same or a nearby locality.

¹⁴Latin *hirsutus*, hairy.

6. Genus *CRYPTODITHA*¹⁵ nov.

FIGURE 6.

ORTHOTYPE: *Tridenchthonius elegans* Beier.

DIAGNOSIS. Marginal teeth of chela prominent, acute and distinctly spaced; subequally developed on both fingers; tending to become contiguous basally on the fingers (fig. 6).

Chaetotaxy of chela as illustrated (fig. 6); seta ET subterminal, about two areolar diameters caudad of DS but at least twice as far from IT as from DS; EST and IT both distinctly distad of median, but well spaced from ET; IST, ESB, and EB, forming an oblique basal series; seta ESB closer to IST than to EB; T, ST, and SB median and distad of median; all well spaced from one another; ST submedian between SB and T; B basal in position and more than three times as far from ESB as from the finger base.

Hand of chela normal in both dorsal and lateral aspects (fig. 6).

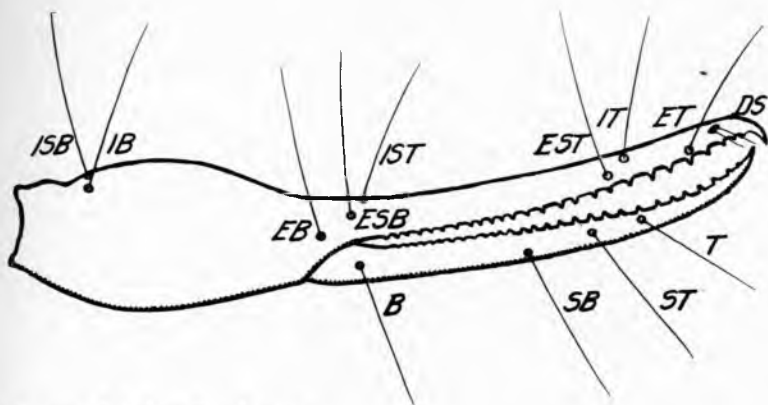
Carapace smooth, weakly emarginate, and provided with a dentate, epistomal process; with four large eyes; vestitural setae sparse (totalling about 28) but robust (shape not described). Tergites uniseriate—with about six marginal setae per segment.

Coxal spines typical; numbering four to five each on coxae I and II.

FIGURE 6.

Cryptoditha elegans (Beier).

Exterior lateral aspect of right chela (From Beier, 1932. Modified).



Intercoxal tubercle absent.

Cheliceral form and chaetotaxy not described.

Presence or absence of tactile seta on tarsus IV not recorded.

Immature examples with multigaleate spinneret—comprising a series of about five simple and contiguous, styletlike galeae.

¹⁵Greek *kryptos*, hidden + *Ditha*..

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Only the orthotype can at present be assigned to this genus. It is thus far known only from Brazil.

REMARKS. Beier's assignment of his species to *Tridenchthonius* cannot be maintained in spite of the fact that juvenile examples of both genera possess galeate spinnerets. It seems probable that this will be found to be characteristic of many, if not all, genera of this family. Beier's species is certainly a member of the present tribe, while the type species of *Tridenchthonius* is certainly not, as is indicated by the fact that it is clearly described as being armed with "many small, contiguous teeth." *Tridenchthonius* must therefore be regarded as really pertaining to the tribe Tridenchthoniini and not the Verrucadithiini. In view of these circumstances, a new genus has been erected for Beier's species.

1. *Cryptoditha elegans*¹⁶ (Beier)

FIGURE 6.

1931. *Tridenchthonius elegans* Beier, Zool. Anz. 93:52.

1932. *Tridenchthonius elegans* Beier, Beier, Das Tierreich, 57:34, tf. 40-41 (left palp and chela).

OCCURRENCE. This species was described from two males and one immature specimen taken at Passa Quatro, Brazil.

2. Tribe TRIDENCHTHONIINI nom. nov.

1929. *Dithini* Chamberlin, Ann. Mag. Nat. Ser. 10, 4:60.

DIAGNOSIS. Marginal teeth of chela generally rounded or truncate, small, closely contiguous, equally developed on both fingers caudally as well as distally. Generally with four eyes, the posterior pair tending toward reduction, and in some cases they have completely disappeared. Some, but not all, of the genera possess a monosetose, intercoxal tubercle.

REMARKS. The name of this tribe is here changed to conform to the synonymy established for the family. As here treated, the group comprises seven genera. One is known only from the Baltic amber; one is common to Africa, South America, Mexico and the West Indies; one occurs in Brazil, South Africa and Sumatra; two are from the Orient; one is common to South America and the Orient; and one is African.

7. Genus CHELIGNATHUS¹⁷ Menge

FIGURE 7.

MONOTYPE. *Chelignathus kochii* Menge.

1854. *Chelignathus* Menge, Berendt, Die in Bernstein befindlichen Organischen Reste der Vorwelt. Vol. 1, 2d part, p. 97. (Designated and described briefly and incidentally in a paragraph of discussion.)

1855. Under *Chthonius Kochii* Menge, Ueber die Scheerenspinnen. Dansiz, p. 26.

1937. Under *Heterolophus* (?) *Kochii* (Menge) Beier, Festschr. Embrik Strand, Riga. Vol. 2, p. 303.

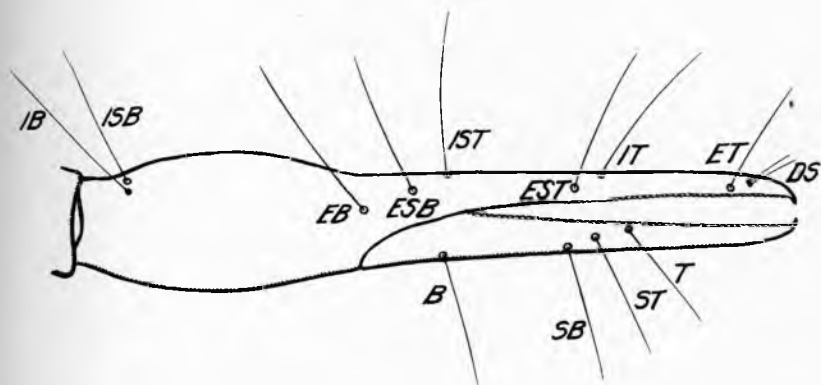
¹⁶Latin *elegans*, elegant.

¹⁷Greek *chela*, a claw or pincer + *gnathos*, a jaw.

DIAGNOSIS. Marginal teeth contiguous, acute and equally developed on both fingers, basally as well as distally (fig. 7).

Chaetotaxy of chela as illustrated (fig. 7). Seta ET in close proximity to DS (about two areolar diameters caudad thereof); IT and IST closely proximate and scarcely distad of median; IST, ESB, and EB in oblique, basal series; ESB distinctly closer to IST than to EB. Seta SB median and in series with ST and T, which are distad of median; the three setae about equally spaced; B distinctly distad of the usual basal position, the distance from B to SB being distinctly less than twice (1.5x) the distance from B to the finger base.

FIGURE 7.
Chelignathus kochii Menge.
(From Beier 1937. Modified.)



Palpal facies normal; no unusual developments on hand of chela; setae IB and ISB basal as is usual (fig. 7).

Carapace very weakly emarginate; subquadrate; no epistomal process; derm smooth (nongranulate); with four well-developed eyes of which the posterior pair are smallest; with a relatively sparse vestiture of setae (about 30). Tergites uniseriate; with about ten marginal setae.

Coxal spines undescribed (not visible in only available material).

Presence or absence of intercoxal tubercle unknown (not visible in material thus far studied).

Chelicerae lacking a spinneret; chaetotaxy unknown.

Presence or absence of process of coxa I not described.

Tactile setae of tarsus IV not described by Beier, but Menge mentions and shows in his figure a short one on the metatarsus at least.

INCLUDED SPECIES AND DISTRIBUTION. Includes only the type species, *Chelignathus kochi* Menge, which is a fossil from the Baltic amber of Europe (Oligocene).

REMARKS. We do not agree with Beier in his assignment of the type species to *Heterolophus*. If he is correct, however, the generic name *Heterolophus* must be synonymized with the earlier *Chelignathus* and not vice versa.

1. *Chelignathus kochi*¹⁸ Menge

FIGURE 7.

1854. *Chelignathus Kochii* Menge: in Berendt: Organische Reste der Vorwelt, Vol. 1, part 2, p. 97.
1855. *Chthonius Kochii* (Menge) Menge, Ueber die Scheerenspinnen, Chernetidae. Danzig, p. 25, pl. 4, fig. 2 (dorsal aspect of entire animal).
1937. *Heterolophus* (?) *Kochii* (Menge) Beier, Festschrift zum Dr. Embrik Strand. Riga, vol. 2, p. 303, fig. 1 (chela).

REMARKS. This species should be readily recognizable from Beier's re-description supplemented by that of Menge. Beier redescribed the species from a single well-preserved specimen in the Museum at Danzig (Nr. 105) which, he states, is "perhaps the type." Menge's description was based on a single specimen "enclosed in a clear piece of amber."

8. Genus *HETEROLOPHUS*¹⁹ Tomosvary

FIGURE 8.

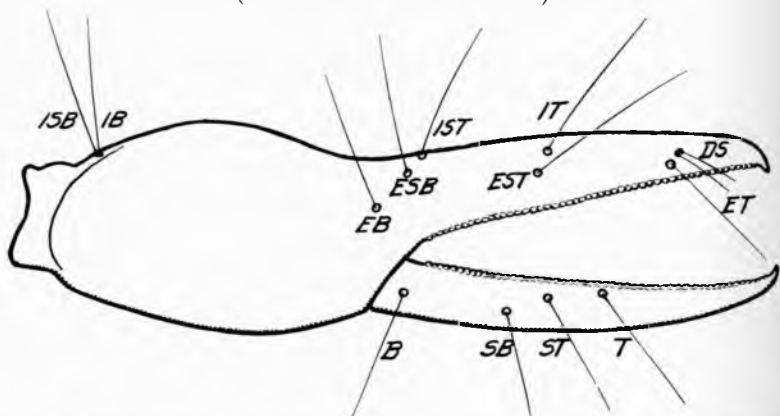
1884. *Heterolophus* Tomosvary, Termesz. Fuzetek, 8:24-25.
1825. *Heterolophus* Tomosvary, Chamberlin, Vidensk. Medd. Dansk naturh. Foren. Copenhagen. 81:337. (*H. guttiger* Tomosvary, chosen as the generic type.)
1929. *Heterolophus* Tomosvary, Chamberlin, Ann. Mag. Nat. Hist. Ser. 10:4:60. (Assigned to Dithidae but listed as doubtful.)
1932. *Heterolophus* Tomosvary, Beier, Das Tierreich: 57:28.
1937. *Heterolophus* Tomosvary, Roewer, Bronn's Klass. und Ord. des Tierreichs. 5:(IV-6): 234.

LECTOTYPE: *Heterolophus guttiger* Tomosvary.

DIAGNOSIS. Marginal teeth of chela blunt or truncate, closely contiguous and well-developed basally and distally on both fingers (fig. 8).

FIGURE 8.

Heterolophus guttier Tomosvary.
(From Beier 1932. Modified.)



¹⁸Named in honor of Dr. Carl Koch, German zoologist and archnologist, who flourished in the first half of the nineteenth century.

¹⁹Greek *heteros*, other or different, + *lophos*, a crest. Structural reference doubtful but probably refers to carapace.

Chaetotaxy of chela as illustrated (fig. 8). Both DS and ET subterminal and one areolar diameter or less apart; IT and EST closely grouped and submedian in position; about as far from ET as from IST; IST, ESB, and EB forming a diagonal, basal series with seta ESB much closer to IST than to EB. T, ST, and SB forming a well-spaced, median series; T slightly distad of median; ST slightly proximad of median; SB and ST slightly closer together than ST is to T; B basal and about three times as far from SB as from the finger base.

Palps of normal facies; more robustly developed than usual, but lacking any morphological peculiarity.

Carapace and palps smooth and nonrugose. Carapace more or less medially emarginate; epistomal process prominent and serrate; with four large and prominent, well-spaced eyes; vestitured with a moderate number of setae (30-35). Form of setae undescribed. Tergites generally uniseriate, although in some cases there is an obscure indication of two rows of setae.

"Very broad" coxal spines of the usual type occur on coxae I and II.

Mesal spinelike process of coxa I not yet noted, but probably present.

Intercoxal tubercle absent.

Spinneret absent; movable finger smoothly rounded; interiorly with a series of four or five irregular teeth. Chaetotaxy unknown.

Presence or absence of tactile setae on the fourth tarsus or abdomen not described.

REMARKS. The foregoing diagnosis is based upon Beier's redescription. Tomosvary's original description of this genus or of its two included species is inadequate to place it in a modern classification, and the validity of the genus, as here defined, rests upon the correctness of Beier's determination of the genotype, *H. guttiger*. Pending the detailed reexamination of Tomosvary's original material, the status of *Heterolophus* cannot be considered secure in view of the fact that certain discrepancies exist between Beier's and Tomosvary's descriptions. These are further discussed under the specific headings.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Three species plus one of "doubtful" status have thus far been assigned to this genus. One (in addition to the doubtful species) is from Brazil, one is from Sumatra, and one is from South Africa.

With the exception of the doubtful form before noted and which would probably run to *guttiger* (teste Beier l.c.), these may be separated by means of the following key.

KEY TO SPECIES OF *HETEROLOPHUS*.

1. Anterior carapacial margin with 8, posterior margin with 4 to 6 setae (total on carapace 30 to 46); tergites uniseriate throughout; seta ESB distinctly closer to IST than to EB.....2
- Anterior carapacial margin with 10, posterior margin with 8, border setae (total on carapace 52 to 54); tergites medially and posteriorly, obscurely biseriate; seta ESB about as close to IST as to EB.....*sumatraensis* (Chamberlin)

2. (1) Carapace with about 46 vestitural setae; posterior carapacial margin with 6 setae; from South America.....*guttiger* (Tomosvary)
 Carapace with about 30 vestitural setae; posterior carapacial margin with 4 setae; from South Africa.....*clathratus* (Tullgren)

1. *Heterolophus guttiger*²⁰ Tomosvary

FIGURE 8.

1884. *Heterolophus guttiger* Tomosvary, Termesz. Fuzetek. 8:24, pl. 1, figs. 3 and 4 (entire animal from dorsal aspect and anterior portion of carapace).
 1888. *Chthonius guttiger* (Tomosvary) Daday, Termesz. Fuzetek. 11:135 and 191; pl. 4, fig. 20 (epistomal process).
 1932. *Heterolophus guttiger* Tomosvary, Beier, Das Tierreich, 57:28, fig. 34 (chela).

REMARKS. Tomosvary's description and figures were based on material secured from Sao Paulo, Brazil. Daday (l.c.) published a supplemental figure of the epistomal process of the carapace, apparently on the basis of Tomosvary's original material. Beier, in redescribing the species, recorded it from Passa Quatro, Brazil, as well as from the type locality, and it seems evident that his description must have been based upon the Passa Quatro material, although he does not specifically so indicate.

While Tomosvary's description is inadequate, there are a couple of points which cast some doubt on the correctness of Beier's determination. Thus Tomosvary describes and illustrates the carapace as prominently emarginate and lacking an epistomal process (Daday, however, apparently on the basis of Tomosvary's material, illustrates the epistomal process as really present and serrate); while the eyes are described as small (but strongly convex) and widely spaced. On the other hand, Beier fails to mention the caparacalmargination and describes the epistomal process as broad and distinctly serrate (in agreement with Daday) and the eyes as large and prominent. Whether these apparent differences are real cannot be ascertained until Tomosvary's specimens can be critically reexamined.

14. *Heterolophus nitens*²¹ Tomosvary

1884. *Heterolophus nitens* Tomosvary, Termesz. Fuzetek, 8:25, pl. 1, fig. 5 (pedipalp).
 1888. *Chthonius nitens* (Tomosvary) Daday, Termesz. Fuzetek, 11:135 and 191. (A repetition of Tomosvary's record.)
 1932. *Heterolophus nitens* Tomosvary, Beier, Das Tierreich, 57:29.

REMARKS. Described by Tomosvary from Sao Paulo, Brazil. Daday merely lists it and comments, under *H. guttiger*, that it differs from that species primarily in the presence of serrations adjacent to the epistomal process (said to be lacking in *H. guttiger*). Beier lists it as a doubtful species and remarks that it is very close to, or identical with, *H. guttiger*. Judging from Tomosvary's original description and figure, the two species, however, seem to be quite distinct. The following couplet contrasts the more important of these apparent differences.

²⁰Latin *gutto*, drop; also a spot or marking on an animal + *gerere*, to carry.

²¹Latin *nitens*, shining, bright, or glittering.

1. Eyes well separated (*distantes*"); chela robust—fingers only a little longer than the hand (1.2 times as long on basis of Tomosvary's illustration, a point in which Beier is in agreement) *guttiger*
 Eyes close together ("*approximati*") ; chela slender, hand ovate, fingers much longer than the hand (1.8 times as long on basis of illustration) *nitens*

On the basis of Tomosvary's original description, it would appear, contrary to both Daday and Beier, that the two species are actually markedly different and might, in fact, quite possibly represent different genera. A critical reexamination of Tomosvary's original material will probably be required to establish the true status of this species.

2. *Heterolophus sumatraensis*²² (Chamberlin)

1899. *Chthonius curvigitatus* Simon (nec Balzan), Ann. Soc. Ent. Belgique, 43:122. (This is a homonym of *Chthonius curvigitatus* Balzan (1890).)
 1906. *Chthonius curvigitatus* Simon (nec Balzan), With, Danske Videnk. Selsk, Skr. Copenhagen 7:(3):74.
 1911. *Chthonius curvigitatus* Simon (nec Balzan), Ellingsen, Ann. Mus. Civ. Hist. Nat. Genova. Ser. 3:5:35.
 1923. *Chthonius sumatraensis* Chamberlin, Rev. Chilena Hist. Nat. 27:186. (New name to eliminate homonymy.)
 1932. *Heterolophus sumatraensis* (Chamberlin) Beier, Das Tierreich, 57:29, fig. 35 (chela).

DISTRIBUTION. Known only from the original description. Sumatra.

3. *Heterolophus clathratus*²³ (Tullgren)

1907. *Chthonius clathratus* Tullgren, Zool. Stud. tillagn. Tullberg. 233, f. 11a-b (movable finger of chelicera and genital operculum of male).
 1912. *Chthonius clathratus* Tullgren, Ellingsen, Ann. S. Afric. Mus. 10:88 and 120.
 1932. *Heterolophus clathratus* (Tullgren) Beier, Das Tierreich, 57:29, fig. 36 (chela).

DISTRIBUTION. Tullgren (l.c.) recorded the species from Natal (Town bush and Maritzburg), and Zululand (Lake Sibayi). One of Tullgren's female specimens carried four developing larvae attached to the vulva.

Ellingsen subsequently recorded the species from the Cape Peninsula of South Africa (Table Mountain near Platteklip). Ellingsen remarks that in his specimen (one only) "the posterior eyes were very little developed." This is unusual and may indicate that Ellingsen actually had another species.

9. Genus PARADITHA²⁴ Beier

FIGURE 9.

ORTHOTYPE: *Chthonius sinuatus* Tullgren.

1931. *Paraditha* Beier, Zool. Anz. 93:51.
 1932. *Paraditha* Beier, Beier, Das Tierreich, 57:30.
 1937. *Paraditha* Beier, Roewer, Bronn's Klass. und Ord. des Tierreichs, 5:(4:6):235.

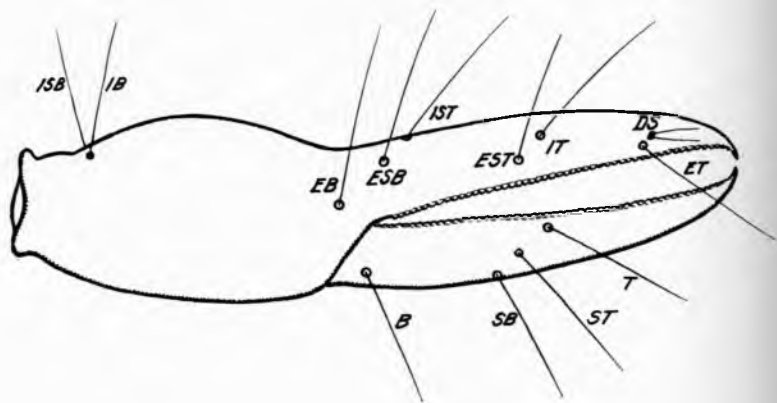
DIAGNOSIS. Marginal teeth numerous, blunt or truncate, closely contiguous and well developed posteriorly and anteriorly on both fingers (fig. 9).

²²Latin, of or pertaining to Sumatra.

²³Greek *klethra*, a lattice. Probably refers to the tessellation of the carapace so characteristic of many Tridenchthoniids.

²⁴Greek *para*, beside + *Ditha*.

FIGURE 9.
Paraditha latimanus Beier.
 (From Beier 1932. Modified.)



Chaetotaxy of chela as illustrated (fig. 9). Seta ET nearly contiguous with DS and subterminal in position; EST and IT in closely proximity and median on the finger; IST, ESB, and EB forming an oblique basal to subbasal series; ESB distinctly closer to IST than to EB. Seta T barely distad of median and in series with ST and SB, all well spaced, but seta ST slightly closer to SB than to T; seta B clearly basal, and about four times as far from SB as from the finger base.

Chela of normal aspect; relatively robust but without any morphological peculiarity (fig. 9).

Carapace granulate or coarsely and reticulately sculptured; crenulate, emarginate and with a small, dentate, epistomal process; with four large and subequally developed eyes; with a moderately abundant (about 54) vestiture of long setae; form and prominence of setae not known. Tergites biseriate, the discal series numbering about four to six and the marginal series about eight per segment.

Coxal spines of the usual type occur on coxae I and II.

Monosetose intercoxal tubercle present.

Chelicerae not yet adequately described; differentiated spinneret lacking.

Presence or absence of tactile setae on fourth tarsus or abdomen not known.

INCLUDED SPECIES AND GEOGRAPHICAL OCCURRENCE. Two species are known to belong to this genus. One (the orthotype) is from tropical West Africa and possibly South Africa; the second is from tropical East Africa.

These two species may be separated by means of the following key:

1. Palpal femur 3.8 times as long as broad; discal series of tergal setae numbering four per segment.....*sinuata* (Tullgren)
- Palpal femur 4.3 times as long as broad; discal series of tergal setae numbering six per segment.....*latimanus* Beier

1. *Paraditha sinuata*²⁵ (Tullgren)

1901. *Chthonius sinuatus* Tullgren, Ent. Tidskr. 22:100.
 1906. *Chthonius sinuatus* Tullgren, Ellingsen, Ann. Mus. Civ. Stor. Nat. Genova, ser. 3, 2:264.
 1912. *Chthonius sinuatus* Tullgren, Ellingsen, Ann. South Africa. Mus., 10:89 and 124.
 1932. *Paraditha sinuata* Tullgren, Beier, Das Tierreich, 57:30.

GEOGRAPHICAL OCCURRENCE. Described from a single specimen from "Camerun," Africa. Later Ellingsen (1906) recorded the species from Portuguese Guinea (Rio Cassine) and S. Thome (Viste Alegre). These were all females and some carried clusters of 6 to 10 developing larvae. Still later the species was recorded (also by Ellingsen, 1912) from South Africa (Cape Province: Retreat). This latter record is open to some doubt.

2. *Paraditha latimanus*²⁶ Beier

(Fig. 9)

1931. *Paraditha latimana* Beier, Zool. Anz. 93:51.
 1932. *Paraditha latimana* Beier, Das Tierreich, 57:31, tf. 37.

OCCURRENCE. Described from several female specimens taken at Mabira in tropical East Africa. Type in Leningrad Museum.

10. Genus DITHA²⁷ Chamberlin

FIGURE 10.

ORTHOTYPE: *Ditha elegans* Chamberlin.

1929. *Ditha* Chamberlin, Ann. Mag. Nat. Hist. Ser. 10. 4:61.
 1932. *Ditha* Chamberlin, Beier, Das Tierreich, 57:25 (pars).
 1937. *Ditha* Chamberlin, Roewer, Bronns Klass. u. Ord. des Tierreichs, 5:(4:6):234 (pars).

DIAGNOSIS. Marginal teeth of chela small, abundant, blunt or truncate and closely contiguous; subequally developed anteriorly and posteriorly on both fingers (fig. 10, A).

Chaetotaxy as illustrated (fig. 10, A). Seta ES subterminal and nearly contiguous with DS (less than one areolar diameter apart). EST and IT about two to three areolar diameters apart; both clearly distad of median, but well removed from ET (IT two to three times as far from ET as from EST). IST, ESB, and EB basal and in oblique series; ESB distinctly closer to IST than to EB. T, ST and SB distad of median and in a subequally spaced series (SB slightly distad of median and about as close to ST as ST is to T); B basal and about 3.5-3.8 times as far from SB as from the finger base.

Palps and chela of normal facies slender, with no special structural modifications (fig. 10, A).

²⁵Latin *sinus*, a curve. Refers to anterior margin of carapace.

²⁶Latin *latus*, broad, + *manus*, hand.

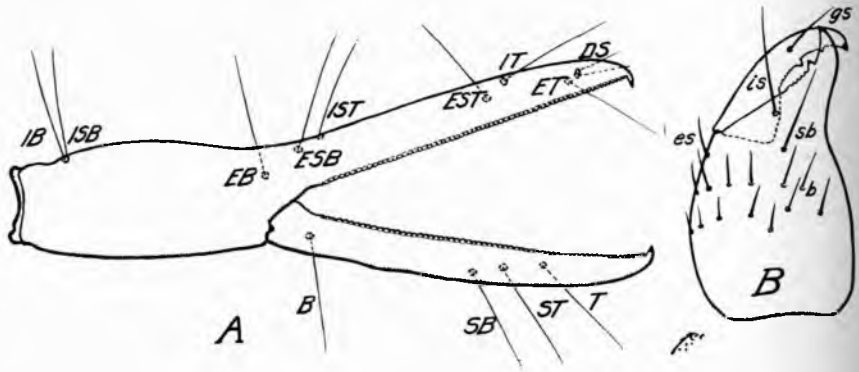
²⁷*Ditha*. An arbitrary combination of letters based on an anagram of the name Edith.

FIGURE 10.

Ditha philippinensis Chamberlin

A—Interior lateral aspect of female chela (Female, Allotype).

B—Dorso-lateral aspect of right chelicera. Serrulae omitted. (Male, Holotype.)



Carapace slightly but clearly emarginate; with a distinct, serrate, epistomal process; posteriorly with a distinct but not conspicuous transverse furrow, which delineates a narrow posterior disc (about as in *Tridenchthonius*); almost smooth, but showing weak granulation (slightly verrucose tessellation). (Palps smooth and polished, but femur with a few scattered granules at points of seta insertions). Carapace with four well-developed eyes, of which the anterior pair are best developed; eyes spaced more than an ocular diameter apart; with an abundant vestiture (70-100) of robust, acuminate setae. Tergites sharply and irregularly biseriate; with about 12-14 setae in the discal and 16-17 in the border series. The zone in which the setae occur is only obscurely tessellate, but the narrow zone distad of the discal setae is minutely and clearly tessellate (appearance conspicuous in stained preparations).

Coxal spines of usual type on coxae I and II; the blades relatively robust; terminally incised into acute but irregular teeth; numbering five to seven on each coxa.

Intercoxal tubercle (monosetose) present.

Chelicera of usual type; differentiated spinneret absent; palm with 10-12 accessory setae (fig. 10, B).

First coxa with a mesal, anteriorly projecting, spinelike protuberance.

Both metatarsus and telotarsus IV apparently lacking a definitely differentiated pseudotactile seta, but they may be broken from the only available material.

Abdomen without elongate pseudotactile setae, but with a short subventral pair on sternite 11.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. As here defined, only two species are included (*Ditha elegans* and *Ditha philippinensis*). All others

subsequently assigned to this genus by Beier, as well as *D. cubana* Chamberlin, pertain to *Tridenchthonius* as here redefined.

The genus *Ditha* is thus far known only from the Philippine Islands (Luzon) and from the Molucca Archipelago (Banda Islands).

The two recognized species may be separated by means of the following key:

1. Chela 4.5-4.6 times as long as broad; tibia 2.15-2.22 times as long as broad.....*elegans* Chamberlin
- Chela 5.0-5.2 times as long as broad; tibia 2.29-2.33 times as long as broad.....*philippinensis* Chamberlin

1. *Ditha elegans*²⁸ Chamberlin

1929. *Ditha elegans* Chamberlin, Ann. Mag. Nat. Hist. Ser. 10. 4:61.

1931. *Ditha elegans* Chamberlin, Chamberlin, The Chelonethida. Figs. 9A (p. 50); 11G and H (p. 52); 34A (p. 137) (carapace; epistomal process of male and female, and chela, respectively).

1932. *Ditha elegans* Chamberlin, Beier, Das Tierreich 57:27.

DIAGNOSIS. (Addenda; incompletely described in original publication.) Carapace hispidously tessellate, distinctly emarginate, and with a distinct, blunt (inversely top-shaped in male), or truncate epistomal process; posterior eyes smaller and less corneate than anterior pair and slightly less than twice the diameter of the anterior eyes caudad; carapacial chaetotaxy about 14-11 (155). Tergites sculptured as in carapace; strongly but irregularly biseriate; chaetotaxy $21 \pm : \frac{6}{19} : \frac{10}{18} : \frac{7}{20} : \frac{15}{18} : \frac{15}{15}$. Sternites smooth,

4 to 7 distinctly divided into weakly sclerotic scuta; uniseriate (formula for segments 4 to 8): 6 : 8 : 9 : 9 : 8. Coxal spines simple, acute; 5 or 6 per coxa. Chelicerae as in *philippinensis*; fixed finger with a large median tooth which is basally preceded by a series of 6 small, acute denticles of uniform size; movable finger with a medium-sized subterminal tooth and a large median tooth (opposite galeal seta), the latter of which is basally preceded by 6 or 7 minute denticles; palm of chelicera with about 10 accessory setae.

Chela as in *philippinensis*; each finger with 62-63 marginal teeth. Palps of normal aspect, trochanter 1.6-1.8 times as long as broad; femur 1.9 times as long as tibia and 4.8-4.9 times as long as broad; tibia 2.1-2.2 times as long as broad; chela 1.3-1.4 times as long as femur, 2.6 times as long as tibia and 4.53-4.54 times as long as broad; fingers 1.6 times as long as hand.

Leg IV: Miofemur 2.44 times as long as deep and 1.4 times as long as tibia; tibia 3.6 times as long as deep; telotarsus 2.1 times as long as metatarsus.

MEASUREMENTS. (mm.) Female (Paratype, JC-259.02003). Total length 1.84. Abdominal breadth $0.79 \pm$. Carapace 0.57 long. Palp: Trochanter 0.298×0.174 ; femur 0.725×0.153 ; tibia 0.394×0.177 ; chela

²⁸Latin, *elegans*, choice, fine, or, neat.

1.007 x 0.221; (0.213 deep); hand 0.394 long; fingers 0.623 long. Leg IV; Miofemur 0.689 x 0.282; tibia 0.494 x 0.136; metatarsus 0.225 x 0.085; telotarsus 0.476 long.

OCCURRENCE. Known only from the type collection made in "Banda" (Dutch East Indies; Molucca Archipelago) by Dr. Th. Mortensen.

2. *Ditha philippinensis*²⁹ Chamberlin

FIGURES 2 E; 10 A, B.

1929. *Ditha philippinensis* Chamberlin, Ann. Mag. Nat. Hist. ser. 10, 4:61, tf. 1 b (coxae and tracheal trunks).

1931. *Ditha philippinensis* Chamberlin, The Chelonethida. Fig. 15B (p. 70); 25A (p. 102) and 45G (p. 169) (flagellum; maxillae, and coxa I; coxae, spiracles, tracheal trunks, and genital area of female, respectively).

1932. *Ditha philippinensis* Chamberlin, Beier, Das Tierreich, 57:27.

DIAGNOSIS. (Addenda; incomplete description only previously given.) As in *D. elegans* in all essential respects except that the palpal proportions are more slender. Carapace hispidously tessellate, emarginate and with a distinct, truncate, epistomal process; posterior eyes distinct but smaller than anterior pair, from which they are removed about two ocular diameters; setae robust and acuminate; chaetotaxy 14-11 (144). Tergites irregularly

biseriate; chaetotaxy $12-17 : \frac{6}{14} : \frac{7}{15} : \frac{10}{14} : \frac{11}{16} : \frac{11}{16} : \frac{12}{14}$. Sternites four

to seven, smooth, with lightly sclerotic scuta developed on the fourth to the seventh or eighth segments; chaetotaxy (4 to 8) : 6-8 : 8 : 9 : 9 : 8. Coxal spines broad and acuminate, five or six per coxa.

Cheliceral structure as illustrated (fig. 10, B); dentition as in *D. elegans*; palm with 12 accessory setae (16 in all).

Chela as illustrated (fig. 10, A); each finger with 62-63 marginal teeth. Palps of normal aspect; trochanter 1.7-1.8 times as long as broad; femur 1.9-2.0 times as long as tibia and 4.8-5.2 times as long as broad; tibia 2.3 times as long as broad; chela 1.3-1.4 times as long as femur, 2.6-2.8 times as long as the tibia and 5.0-5.3 times as long as broad; fingers 1.5-1.6 times as long as hand.

Leg IV: Miofemur 2.4-2.5 times as long as deep and 1.35 times as long as tibia; tibia 3.6-3.8 times as long as deep; metatarsus 2.8-2.9 times as long as deep; telotarsus 2.2-2.3 times as long as metatarsus.

MEASUREMENTS. (mm.) Male (holotype): Total length 1.60. Carapace 0.56 long. Palps: Trochanter 0.272 x 0.154; femur 0.695 x .134; tibia 0.359 x 0.155; chela 0.951 x 0.180 (0.172 deep); hand 0.385 long; fingers 0.561 long. Leg IV: Miofemur 0.638 x 0.6262; tibia 0.470 x 0.125; metatarsus 0.208 x 0.072; telotarsus 0.484 long.

Female (allotype): Total length 1.90; abdominal breadth 0.74. Carapace 0.54 long, 0.59 broad across the eyes, and 0.66 broad behind. Palps:

²⁹Latin, of or pertaining to the Philippine Islands.

Trochanter 0.282 x 0.162; femur 0.682 x 0.138; tibia 0.344 x 0.159; chela 0.968 x 0.186 (0.180 deep); hand 0.377 long; fingers 0.594 long. Leg IV: Miofemur 0.648 x 0.266; tibia 0.492 x 0.138; metatarsus 0.221 x 0.080; telotarsus 0.492 long.

OCCURRENCE. Known only from the type collection. Mt. Makiling, Luzon, Philippine Islands (C. F. Baker).

11. Genus *DITHELLA*³⁰ nov.

FIGURE 11.

ORTHOTYPE: *Chthonius javanus* Tullgren.

DIAGNOSIS. Marginal teeth of chela numerous, contiguous, rounded or truncate and subequally developed from base to tip of either finger (fig. 11, B).

Chaetotaxy of chela as illustrated (fig. 11, A, E); DS subterminal and less than an areolar diameter distad of ET (fig. 11, E); IT and EST distinctly distad of median, obliquely paired and with IT and one areolar diameter or less distad of EST; IT, ESB and EB in oblique basil series, with ESB much closer to IST than to EB; ISB and IB transversely paired and situated dorsally on the base of the hand; T, ST and SB subequally spaced (ST slightly closer to SB than to T) and nearly median on the finger; B basal and about three and one-half times as far caudad of SB as it is distad of the finger base.

Palpal facies normal; without points of marked or unique specialization (fig. 11 A, B).

Carapace, palps and tergites almost smooth. Carapace (fig. 11, A) with anterior margin nearly transverse and not at all emarginate; epistomal process well developed, dentate; with 4 eyes of which the posterior pair is scarcely corneate and much less conspicuous than the anterior pair from which they are separated by about one ocular diameter; with a relatively sparse vestiture of comparatively slender acuminate setae (less than 50 in the orthotype). Tergites evenly uniseriate, each with a marginal series of 6-10 setae.

Coxal spines relatively elongate and both laterally and terminally incised; about 4 per coxa (fig. 11, C).

Inter-coxal tubercle present; monosetose.

Mesal spinelike process of coxa I present.

Chelicerae of usual type; lacking a differentiated spinneret; with about 3 accessory setae; dentition of usual facies (fig. 11, A).

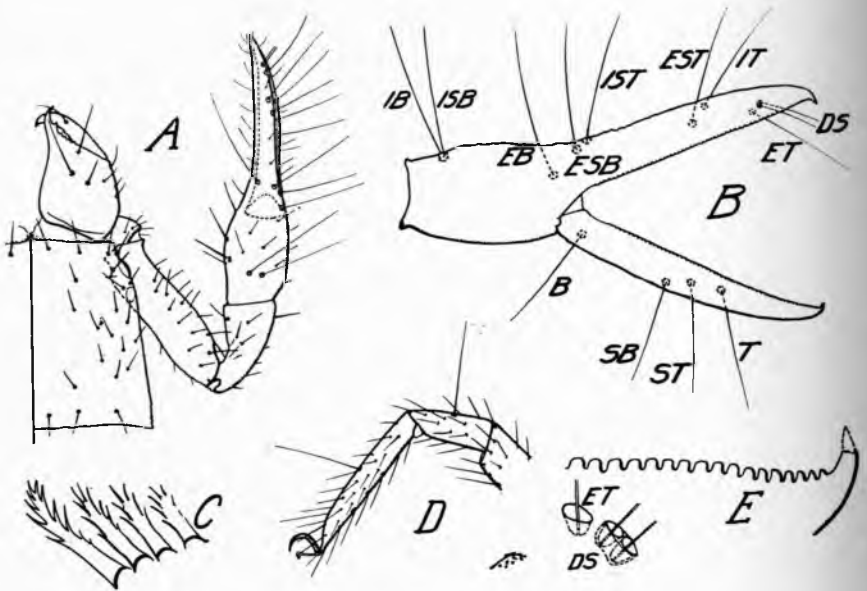
Fourth tarsus with a distinctly differentiated, submedian pseudotactile seta on both metatarsus and telotarsus (fig. 11, D).

³⁰Diminutive of Ditha.

FIGURE 11.

Dithella javana (Tullgren).

- A—Right half of carapace, right chelicera and dorsal aspect of right pedipalp.
 B—Interior lateral aspect of left chela.
 C—Coxal spines (from right coxa I).
 D—Metatarsus and telotarsus of leg IV showing pseudotactile setae.
 E—Exterior aspect of tip of fixed finger of left chela showing dentition.
 (All figures drawn from female, JC-321.01001.)



Number and disposition of abdominal tactile setae unknown.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Known only from the orthotype which is from Java.

REMARKS. This genus is segregated from *Compsaditha*, which it closely resembles, principally on the basis of the chaetotaxy of the movable finger of the chela (ST and SB well spaced rather than nearly contiguous) and on the character of the coxal spines which are laterally, as well as terminally, deeply incised.

1. *Dithella javana*³¹ (Tullgren)

FIGURE 11.

1912. *Chthonius javanus* Tullgren, Notes from the Leyden Museum, 34:269, t.f. (pedipalp).
 1929. *Compsaditha javana* Chamberlin, Canad. Ent. 61:152. (Homonymous synonym based on part of Tullgren's original but unlabeled material.)
 1931. *Compsaditha javana* (Tullgren) Chamberlin, The Chelonethida, figs. 13, J (p. 66) (chelicera); 17, A and B (p. 77) (fixed and movable fingers of chelicera) and 28, A and B (p. 120) (dorsal and ventral aspects of pedipalp).
 1932. *Compsaditha javana* (Tullgren) Beier, Das Tierreich 57:30.

³¹Of or pertaining to Java.

DIAGNOSIS. (Addenda.) Carapace subquadrate (fig. 11, A); nearly transverse across anterior margin and with a distinct, dentate epistomal process; four eyes, of which the posterior pair are reduced, inconspicuous and about one ocular diameter caudad of the anterior pair (teste Tullgren); setae slenderly acuminate; chaetotaxy 8-6 (46). Tergites uniseriate; chaetotaxy, 6 : 8 : 8 : 10 : 9-10 : 9-10. Sternites bordered by 6-8 acuminate marginal setae. Chelicera of usual type; with three accessory setae (as previously illustrated, Chamberlin 1931 l.c.).

Coxal spines subequally developed on both I and II comprising a series of four rather elongate subcontiguous blades, each of which is laterally, as well as terminally, incised or deeply serrate (fig. 11, C).

Fourth metatarsus and telotarsus each with a median, slender, pseudo-tactile seta (fig. 11, D).

Chela as illustrated (fig. 11, B, E); marginal teeth numbering 54 and 52 on the fixed and movable finger, respectively.

Palps robust, as illustrated (fig. 11, A) (see also Chamberlin, 1931 l.c.); trochanter 1.8 times as long as broad; femur 1.7 times as long as tibia and 3.8 times as long as broad; tibia 1.9 times as long as broad; chela 1.5 times as long as femur, 2.5 times as long as tibia, and 4.1 times as long as broad; fingers 2.1 times as long as hand.

MEASUREMENTS. (mm.) Female (JC-321.01001). Total length 1.01. Abdominal breadth 0.47. Carapace about 0.40 long; 0.37 broad across eyes and 0.45 broad behind. Palps: Trochanter .187 x .107; femur .364 x .096; tibia .221 x .114; chela .548 x .132; hand .175 long; fingers .375 long. No pedal measurements taken.

OCCURRENCE AND REMARKS. The foregoing descriptive data were secured from a single female (JC-321.01001) lent to us through the courtesy of Dr. A. E. Oudemans of Leyden, Holland. It came originally to Chamberlin (1929) undetermined and was erroneously described as new. Although not so labeled, it was later concluded that the specimen was from Tullgren's type material, since the collection data of the specimen agreed completely, so far as they went, with the data given by Tullgren.

Known only from Java (Banjoewangi). Tullgren recorded 3 females (type in the Leyden Museum) which were taken in company with 22 specimens of an immature atemnid, doubtfully determined as "*Chelifer*" (= *Catantemnus thorelli* (Balzan)); an adult male of "*Chelifer*" (= *Mucrochelifer borneoensis* and an immature "*Chelifer*" (sp. indet.) all from under the elytra of a single large beetle (Passalidae; *Eriocnemis tridens* (Wied.).

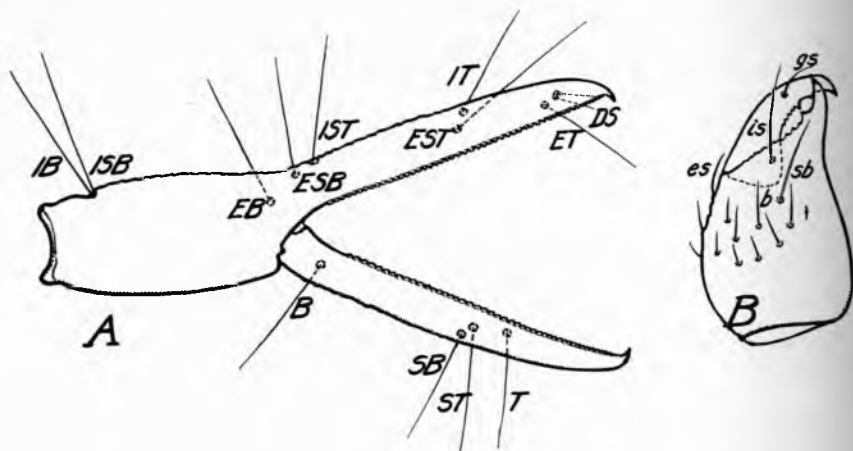
The number and spacing of the eyes as given above is based upon Tullgren's description. In the specimen studied by us the posterior pair of eyes is not evident with certainty.

FIGURE 12.

Tridenchthonius serrulatus (Silvestri).

A—Interior lateral aspect of left chela (female, JC-789.01001).

B—Dorso-lateral aspect of left chelicera. Serrulae omitted (female, JC-789.01001).

12. Genus *TRIDENCHTHONIUS*³² Balzan

FIGURES 1, 2J, 12, 13, 14, 15

MONOTYPE: *Tridenchthonius parvulus* Balzan.

1887. *Tridenchthonius* Balzan, Chernet. S. America, Asuncion, Vol. 1, No. 7. (No pagination.)
1890. *Tridenchthonius* Balzan, Balzan, Ann. Mus. Civ. Stor. Genova, ser. 2, 9:450; pl. 17, f. 28 (dorsum entire animal) and 28a (galeate spinneret).
1891. *Tridenchthonius* Balzan, Balzan, Ann. Soc. ent. France, 60:550.
1894. *Tridenchthonius* Balzan, Hansen, Ent. Meddel. Ent. Foren. Copenhagen 4:3-5:230 and 232.
1906. *Tridenchthonius* Balzan, With, Kgl. Danske Vid. Selsk. Skr. Copenhagen. Ser. 7, 3:64.
1925. *Tridenchthonius* Balzan, Chamberlin, Vid. Medd. Dansk naturh. Foren. 81:334.
1929. *Tridenchthonius* Balzan, Chamberlin, Ann. Mag. Nat. Hist. ser. 10. 4:77.
1930. *Afroditha* Beier R. Boll. Labor. Zool. gen. a agraria, Portici. 25:47 (Orthotype: *Chthonius serrulatus* Silvestri).
1931. *Tridenchthonius* Balzan, Chamberlin, The Chelonethida, pp. 202, 212; and fig. 17, O (p. 177) (spinneret).
1932. *Ditha* (pars) + *Tridenchthonius* Balzan, Beier, Das Tierreich, 57:25 and 34.
1932. *Ditha* (pars) + *Tridenchthonius* Balzan, Roewer, Bronns Klass. u. Ord. Tierreichs. 5:(4:6):234 and 235.

DIAGNOSIS. Marginal teeth of chela small and acute to blunt, but very closely contiguous and subequally developed anteriorly and posteriorly on both fingers (fig. 12, A).

³²Latin, *tridens*, having three teeth or prongs. Greek *chthonios*, in or under the earth. First part of name refers to the triple galea of the nymph.

Chaetotaxy of chela as illustrated (figs. 12, A, 14, E). Seta ET subterminal and one areolar diameter or less caudad of DS; both IT and EST slightly but distinctly distad of median and very closely adjacent (about 1-2 areolar diameters apart); IT at least 3-4 times as far from ET as from EST; IST, ESB and EB in oblique basal series; ESB closer to IST than to EB. T, ST and SB all distinctly distad of median; ST and SB subcontiguous, one areolar diameter or less (generally the latter) apart; T about three areolar diameters distad of ST; B basal and about three and one-half times as far caudad of SB as it is distad of the finger base.

Palpal facies normal; without marked points of specialization (fig. 12, A).

Carapace and palps smooth or at most minutely hispidously tessellate or granulate. Carapace slightly to distinctly emarginate; with or without a blunt epistomal process; with a distinct and relatively conspicuous transverse furrow which delineates a very narrow posterior disc (fig. 13, F); anterior eyes well developed; posterior eyes reduced or vestigial and in some cases absent; provided with an abundant vestiture of setae (carapace with a total of 80-160 setae). Tergites obscurely tessellate over entire surface, distinctly but often very irregularly, biseriate at least on median and posterior segment; discal series with 2-16 setae, border series with 8-14 \pm setae; no distinct zone of prominent tessellation distad of discal setae such as occurs in *Ditha*.

Coxal spines a transverse contiguous row of 5 or 6 relatively broad, acuminate or terminally incised blades per coxa.

Mesal spinelike process of coxa I present.

Intercoxal tubercle present; monosetose.

Chelicera of usual type, with six to nine accessory setae; lacking a differentiated spinneret in the adult, but with a series of three simple galeae in all nymphal stages (tri-galeate) (fig. 14F, 15F); dentition of usual facies (fig. 12B, 13B).

Fourth metatarsus with a short submedian pseudotactile seta (about as long as or shorter than length of the metatarsus itself); telotarsus with a very short pseudotactile seta (scarcely twice as long and morphologically scarcely different from the usual vestitural seta) situated slightly but clearly distad of median (fig. 13, K). Tarsal pseudotactile setae definitely known to occur in only two or three of the included species, but occurrence, very probably, of true generic extent. Because of the fact that the areolar insertions of these setae are not differentiated from those of the usual vestitural type, no certain inference can be drawn as to their presence or absence in case the setae are broken from the specimen, as often occurs.

In some of the included species at least, (*T. mexicanus* and *T. juxtlahuaca* spp. n.), a submedian pair of the marginal setae of tergites 8 or 9 to 11 and sternite 10 are more elongate than usual and semi-tactile in nature; the longest and most slender of these occur para-anally on the eleventh segment (fig. 13, A).

IDENTITY OF THE GENUS. The generic identity of the species here assigned to *Tridenchthonius* is based upon the extremely close similarity of the nymphal forms here described for *T. mexicanus* and *T. juxtlahuaca* with the nymphal specimens of *T. parvulus* upon which Balzan's genus was based. Further, there is a distinct possibility that *T. parvulus* Balzan is actually synonymous with his species *Chthonius parvidentatus*, which is unquestionably also a member of *Tridenchthonius* as here defined. Should, however, *Tridenchthonius parvulus* ultimately prove to be generically distinct from the rest of the species, Beier's name *Afroditha*, here synonymized with *Tridenchthonius*, is available for the group.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Nine species seem certainly referable to this genus as here defined. Three are South American, one West Indian, two Mexican and three African. They include all but four of the species assigned to the genus *Ditha* by Beier in 1932 (Das Tierreich, 57:25). The following key is based (1) upon data secured by personal observations where possible and (2) upon data taken from Beier's descriptions and redescrptions of included species (excepting only *Tridenchthonius parvulus*, which is included on the basis of Balzan's published data). This point is important to consider, since in two cases in particular there are apparent marked disagreements between the original descriptions and Beier's accounts. These discrepancies involve Balzan's species *parvidentatus* and Tullgren's species *buchwaldi*. Consequently, following the main table, a supplementary key for the South American species of the genus as based entirely on data drawn from the original descriptions, is presented. The final resolution of the apparent disagreements involved will necessarily devolve upon someone having access to actual material.

KEY TO THE SPECIES OF TRIDENCHTHONIUS.

1. Fingers of chela 1.2-1.3 times as long as hand; chela 3.9 times as long as broad; from Paraguay.....1. *parvulus* Balzan
Fingers of chela not less than 1.4 times as long as the hand; chela at least 4.3 times as long as broad.....2
2. (1) Carapace bearing a total of about 160 robust vestitural setae; hand of chela 2.1-2.2 times as long as broad; from South America.....3
Carapace bearing not more than 140 vestitural setae (mostly fewer); hand of chela less than twice as long as broad (1.6-1.95).....4
3. (2) Femur 4.1-4.2 times as long as broad; fingers of chela 1.6 times as long as the hand; from Paraguay and Venezuela.....2. *parvidentatus* (Balzan)
Femur 4.5-4.6 times as long as broad; fingers of chela 1.4 times as long as the hand; from Ecuador.....3. *buchwaldi* (Tullgren)
4. (2) Marginal series of tergal setae numbering 10-14 (usually about 12); carapace bearing 110-140 vestitural setae.....5
Marginal series of tergal setae numbering 7-9 (mostly 8); carapace bearing not more than 100 vestitural setae (mostly 80-85); Mexican species.....6
5. (4) Femur 4.6 or more times as long as broad; setae ST and SB of movable finger of chela transversely paired and contiguous.....6
Femur 4.1-4.3 times as long as broad; setae ST and SB obliquely paired and slightly but clearly noncontiguous (but still less than one areolar diameter apart).....7
6. (5) 5.0 times as long as broad; the distance from seta SB to B about 4.1-4.2 times as great as the distance between setae T and ST; posterior eyes less strongly corneate than the anterior pair, but distinct; from South America (Dutch Guiana).....4. *surinamus* (Beier)

- Chela 5.3-5.5 times as long as broad; the distance between setae SB and B about 4.8 times as great as that between ST and T; posterior eyes non-corneate "spots"; from Tropical East Africa (Mabira).....5. *africanus* (Beier)
7. (5) Chelicera with 8 or 9 accessory setae; carapace with a total of 130-140 vestitural setae (10 posterior border setae in the female; 8 or 9 in the male); epistomal process relatively prominent, basally broad and variously dentate; the distance between setae SB and B more than 4.5 times as great as that between ST and T; from Africa (Nigeria)6. *serrulatus* (Silvestri)
Chelicera with 6 accessory setae; carapace with a total of about 112 vestitural setae, of which 8 border the posterior margin (in female; male not yet known); epistomal process reduced—nearly vestigial; from Cuba.....7. *cubanus* (Chamberlin)
8. (4) Posterior margin of carapace bordered by 8 setae in both sexes; coxal spines acuminate or nearly so; fingers of chela 1.5-1.7 times as long as the hand; posterior eyes vestigial; fourth femur 2.2-2.4 (male and female respectively) times as long as deep; Mexican cave inhabiting species (Cueva de Juxtlahuaca).....8. *juxtlahuaca* n.sp.
Posterior margin of carapace bordered by six setae in either sex; coxal spines terminally incised; fingers of chela 1.7-1.9 times as long as the hand; posterior eyes distinctly present, although less conspicuous than the anterior pair; fourth femur 2.4-2.7 (male and female respectively) times as long as deep; free living Mexican species9. *mexicanus* n.sp.

On the basis of, and assuming the accuracy of, the original data given by the describers of the species involved, the four South American species of *Tridenchthonius* should be separable by means of the following supplementary key:

SUPPLEMENTARY KEY TO SOUTH AMERICAN SPECIES OF TRIDENCHTHONIUS.

- A—Chela 5.0 or more times as long as broad.....B
Chela 3.9 times as long as broad (in tritonymph; should be about same in the adult)1. *parvulus* (Balzan)
- B—Femur 4.2-4.3 times as long as broad.....3. *buchwaldi* (Tullgren)
Femur 4.5-5.0 times as long as broad.....C
- C—Fingers of chela 1.5 times as long as hand; chela 5.2 times as long as broad.....
.....2. *parvidentatus* (Balzan)
Fingers of chela 1.6-1.7 times as long as hand; chela 5.0 times as long as broad.....
.....4. *surinamus* (Beier)

1. *Tridenchthonius parvulus*³³ Balzan

1887. Balzan, Chernet. S. America, Asuncion, Vol. 1, No. 7. (No pagination.)
1890. Balzan, Ann. Mus. Civ. Stor. Genova, ser. 2, 9:450; pl. 17, f. 28, 28a (entire animal, from dorsal aspect, and spinnerets).
1891. Balzan, Ann. Soc. ent. France, 60:550 (Measurements).
1931. Balzan, Chamberlin, The Chelonethida, pp. 202, 212; fig. 17 (p. 177) (spinnerets).
1932. Balzan, Beier, Das Tierreich, 57:34.
1932. Balzan, Roewer, Bronns Klass u. Ord. Tierreichs, 5:(4:6):234 and 235.

OCCURRENCE. The species is known only from the type collection of two juvenile specimens. They were found under bark at Rio Apa, Paraguay.

It is certain that the two specimens upon which Balzan based this species were immature (i. e., they were galeate). It is almost equally sure

³³Latin, *parvulus*, diminutive of *parvus*, very little, minute.

that they were in the last nymphal instar (i. e., tritonymphs). This latter inference is based upon three factors: (1) the measurements of *parvulus* as given by Balzan (1891); (2) a knowledge of the relative sizes of tritonymph and adult in one of the related species herein described (*Tridenchthonius mexicanus*); and (3) the fact that adults of all known species of this genus do not differ significantly in size. Thus the length of the femur in all 8 species in the genus of which the adult is known range from a minimum of .45 mm. to a maximum of .54 mm. In *T. mexicanus* sp. nov. the femur of the adult is .44-.45 mm. long; that of the tritonymph .30 mm. In *T. parvulus* the femoral length is given by Balzan as .305 mm. It is therefore inferred that the adult of *T. parvulus* must be of a size very close to that of *T. mexicanus*. The only data of critical specific value given by Balzan for his species are the palpal measurements.

As is shown in the description of *T. mexicanus* n. sp., certain of the palpal proportions of the tritonymph are found to be essentially identical with those of the adults. By assuming the accuracy of Balzan's measurements and by employing these particular ratios it becomes possible tentatively to include *T. parvulus* in the key to the species.

The related species *T. parvidentatus* (Balzan) was also collected at Rio Apa, Paraguay, and we were at first inclined to believe that *parvulus* and *parvidentatus* were probably nymph and adult, respectively, of the same species. This is not borne out by the appendicular proportions as derived from the palpal measurements given by Balzan, however, and for the present, at least, they may be regarded as probably distinct.

Balzan, in his illustration of *T. parvulus* (1890, l.c. pl. 17, fig. 28) apparently shows *two* tactile setae dorsally at the base of the hand, as is characteristic of adults of all representatives of the family. This is unquestionably an error on Balzan's part, since only *one* such seta occurs in the nymph (tritonymph).

SPECIFIC DATA. As a matter of convenience, certain of Balzan's descriptive data and his measurements for the species are republished herewith. In addition certain proportions derived from these measurements are likewise given for sake of comparison.

Body smooth; carapace nearly quadrate, slightly longer than broad; smooth; with 4 eyes; fingers of chela provided with many small contiguous teeth. Palpal proportions: femur 1.5 times as long as tibia and 3.4 times as long as broad; tibia 2.05 times as long as broad; chela 1.5 times as long as femur, 2.3 times as long as tibia and 3.9 times as long as broad; fingers 1.23 times as long as the hand, which is 1.75 times as long as broad.

MEASUREMENTS. (mm.) (ex Balzan, 1891, l.c.). Total length 1.20. Carapace .415 x .390. Palps: femur .305 x .090; tibia .205 x .100; chela, .470 x .120; hand .210 long; fingers .260 long.

2. *Tridenchthonius parvidentatus*³⁴ (Balzan)

1890. *Chthonius parvidentatus* Balzan, Ann. Mus. Civ. Stor. Nat. Genova. Ser. 2, 9:447; pl. 17, f. 25 and 25a (fig. of whole animal and dentition of chela).
 1891. *Chthonius parvidentatus* Balzan, Ann. Soc. Ent. Fr. 60:547; pl. 12, f. 36 (measurements; fig. of palps and a new record).
 1923. *Chthonius parvidentatus* Balzan, Chamberlin, Rev. Chilena Hist. Nat. 27:185 (in key).
 1932. *Ditha parvidentata* (Balzan) Beier, Das Tierreich, 57:25, t.f. 30 (chela).

OCCURRENCE AND REMARKS. Balzan's original material was from Paraguay (Rio Apa; from rotting debris beneath bark of a dead tree ("albero")). In 1891 he recorded it also from "Venezuela: San Esteban."

It is not known from which of these lots Beier secured the specimens for his "redescription" of the species upon which, for the present at least, a "correct" determination must depend. The data supplied by Beier, rather than Balzan, have been employed in the main key. This is important to remember, since the measurements as given by Balzan (1891) and Beier (1932) do not agree. As a matter of fact, employing ratios derived from Balzan's published data, the species will "key out" to *buchwaldi* rather than *parvidentatus*. This discrepancy obviously cannot be solved in the absence of material.

3. *Tridenchthonius buchwaldi*³⁵ (Tullgren)

1907. *Chthonius (Pseudochthonius) Buchwaldi* Tullgren, Mitt. Naturhist. Mus. Hamburg. 24:69; pl. 5, f. 23, a, b (pedipalp and chelicera).
 1923. *Chthonius buchwaldi* Tullgren, Chamberlin, Rev. Chil. Hist. Nat. 27:186 (in key).
 1929. *Chthonius buchwaldi* Tullgren, Chamberlin, Bull. Soc. Zool. Paris, 54:175 (note).
 1932. *Ditha buchwaldi* (Tullgren) Beier, Das Tierreich, 57:26, t.f. 26 (pedipalp).

OCCURRENCE AND REMARKS. Known only from the type collection which was from Guyaquil, Ecuador. Types in the Natural History Museum of Hamburg. Tullgren's description is inadequate in points now regarded as of greatest importance, and reliance must be placed on Beier's redescription (l.c.) which would seem to have been based upon type material, although not explicitly so stated by that author. Certain discrepancies between Beier's and Tullgren's account are apparent. It is tentatively assumed that these were errors on Tullgren's part, although this cannot be finally decided until actual material becomes available.

4. *Tridenchthonius surinamus*³⁶ (Beier)

1931. *Ditha surinama* Beier, Zool. Anz. 93; 49.
 1932. *Ditha surinama* Beier, Beier, Das Tierreich, 57:26, t.f. 31 (chela).

OCCURRENCE AND REMARKS. Known only from the type collection. Taken from a fallen tree, Surinam (Dutch Guiana): Paramaribo. The species is quite distinct from the other South American forms and seems closest to those from Africa.

³⁴Latin *parvus*, little or small, plus *dentatus*, provided with teeth. Refers to the small, contiguous teeth of the chela.

³⁵Named for the original collector (or donor?) of the specimen upon which the species is based, Herr von Buchwald.

³⁶Latin, of, or pertaining to, Surinam (i.e. Dutch Guiana).

5. *Tridenchthonius africanus*³⁷ (Beier)

1924. *Chthonius clathratus* Redikorzev (*nec* Tullgren) Rev. Russ. Ent. 18:199. (misdetermination.) Included in key and under remarks.
 1930. *Ditha africana* Beier, Zool. Anz. 93:50.
 1932. *Ditha africana* Beier, Beier Das Tierreich, 57:27, t.f. 32 (chela).

OCCURRENCE AND REMARKS. Known only from the type collection (types in museum at Leningrad) which was from Mabira in tropical East Africa. See above annotation to Redikorzev, 1924.

The species is apparently closest to *A. serrulatus*.

6. *Tridenchthonius serrulatus*³⁸ (Silvestri)

FIGURES 12, A AND B.

1918. *Chthonius* (*sic* mis-spelling of *Chthonius*) *serrulatus* Silvestri, Boll. Lab. Zool. gen. e agrar. Portici, 12:294, t.f. V (dorsal view of entire animal) and VI: 1 (epistomal process); 2 and 3 (chelicera); 4, 5 and 6 (flagellum and serrulae of chelicera); 7 (maxillae); 8 (palp); 9 (chela); 10 and 11 (legs I and IV); 12 (tip of tarsus); and 13 (male genital operculum).

DIAGNOSIS (Addenda). Carapace with a weakly defined posterior furrow which is apparently more distinct in the female than in the male; distinctly but not prominently emarginate; with a distinct and rather broad epistomal process which is more or less truncate in the female, but semi-acute in the male, more or less dentate in both sexes but more conspicuously so in the male; anterior eyes well developed, strongly corneate, more than their diameter from the anterior margin and about their own diameter from the non-corneate posterior eyes; chaetotaxy 12-10 (140±) in the female and 12-8 or 9 (130±) in the male. Tergites distinctly biseriata in the female, but only weakly so in the male (perhaps better, irregularly uniseriate).

Tergal chaetotaxy of female about: $18 : \frac{7}{12} : \frac{6}{12} : \frac{4}{13} : \frac{6}{12} : \frac{7}{14} : \frac{8}{13} : \frac{7}{13}$;

of the male about $10; 12 : \frac{2}{10} : \frac{2}{10} : \frac{3}{10} : \frac{5}{10} : \frac{4}{10}$. Sternal chaetotaxy (both

sexes, segments 4-9), $6 : 8 : 8 : 8 : 8 : 8$; sternites 4 to 6 divided into lightly sclerotic scuta.

Chelicerae as illustrated (fig. 12, B); with 8 or 9 (generally the latter) accessory setae. Chela as illustrated (fig. 12, A); fixed finger with 52-57, movable finger with 46-48 marginal teeth.

Palpal proportions: Trochanter 1.7-1.8 times as long as broad; femur 1.6-1.8 times as long as tibia and 4.1-4.2 times as long as broad; tibia 2.2-2.4 times as long as broad; chela 1.3-1.5 times as long as femur, 2.4 times as long as tibia, and 4.8-5.0 times as long as broad; fingers 1.6-1.7 times as long as hand; hand 1.8-1.9 times as long as broad.

³⁷Latin, *Afri, African*. Of, or pertaining to, Africa.

³⁸Latin, *serrula*, a small saw. Refers to the contiguous teeth of the chela.

Leg IV. Miofemur 1.3-1.4 times as long as tibia and 2.1-2.2 times as long as deep; tibia about 3.6(?) times as long as deep; metatarsus 2.5-2.6 times as long as deep; telotarsus 2.5-2.6 times as long as deep; telotarsus only slightly shorter than tibia.

MEASUREMENTS (mm.) Male (JC-789.01005). Total length 1.02. Carapace 0.41 long. Palps: Trochanter 0.201 x 0.110; femur .408 x .100; tibia .258 x .107; chela .607 x .121; hand .226 long; fingers .391 long. Leg IV: Miofemur 0.426 x 0.203; tibia 0.328 x 0.089; metatarsus 0.151 x 0.060; telotarsus 0.324 long. Female (JC-789.01001 (except as indicated)). Total length 1.32. Carapace 0.44 long; ocular breadth 0.48; posterior breadth 0.48. Palps (female—789.01004): trochanter .188 x .113; femur .437 x .103; tibia .245 x .110; chela .589 x .589 x .124 (.121 deep); hand .224 long; fingers .372 long. Leg IV: Miofemur .522 x .235; tibia .377 long; metatarsus .180 x .069; telotarsus .361 long.

MATERIAL EXAMINED AND OCCURRENCE. Three males (JC-789.01002, 3 and 5) and 2 females (JC-789.01001 and 4). Collected on a carabid beetle from a laboratory screen by Dr. C. B. Philip at Lagos, Nigeria, December 11, 1928.

Silvestri recorded the types (male and female) as having been collected in a gallery of *Eutermes tenebricus* from near Olakemeji, Nigeria. Two additional females (recorded as paratypes) were listed as from the Gold Coast (Aburi). It was apparently upon one of these two specimens (a mutilated female (femur of palps crushed)) that Beier (1930) based his purported redescription of "*serrulata*". In our opinion, both Silvestri and Beier erred in their determination of the Gold Coast material. In fact, the specimen described as this species by Beier not only represents a distinct species, but must be referred to another genus as well (*Compsaditha aburi* n.sp., q.v.).

The descriptive and illustrative material presented in this paper is drawn up entirely on the basis of the Lagos Nigeria collection above recorded. While we feel reasonably sure of the determination, our material agreeing closely in most respects with Silvestri's description and extensive illustrations, there remain a few points of apparent discrepancy and it is conceivable that two forms are really involved. Thus, it may be noted that Silvestri describes the species as possessing only the two anterior eyes. In our material two pairs of eyes are evident (in stained specimens), although the posterior pair are non-corneate and distinctly less conspicuous than the anterior pair. We do not regard this discrepancy as serious; in unstained material it is almost impossible to see the posterior eyes or eye-spots once the specimen is mounted on a slide, although they should be easily visible in alcoholic material in certain lights, due to reflections from the tapetum. Silvestri's illustration also gives the impression that the number of carapacial and tergal setae were fewer in his than in our material. Reexamination of the types will be necessary to clear up this point.

7. *Tridenchthonius cubanus*³⁹ (Chamberlin)

FIGURES 1 AND 2J

1929. *Ditha cubana* Chamberlin, Ann. Mag. Nat. Hist. Ser. 10, 4:61; tf. 1, H (flagellum) 2, E (coxal spines); 2, L (leg IV); 3, B (pedipalp).
 1931. *Ditha cubana* Chamberlin, Chamberlin, The Chelonethida f. 13, E (p. 166) (chelicera); f. 43, C and D (p. 162) (legs I and IV); f. 46, I (p. 173) (spiracle); f. 52, B (p. 191) (genital area of female) and f. 54 (p. 210) (entire animal).
 1932. *Ditha cubana* Chamberlin, Beier, Das Tierreich, 57:26.

DIAGNOSIS. (Addenda; from female holotype). Carapace very weakly emarginate; epistomal process dentate but much reduced; with four eyes, of which the posterior pair is reduced, scarcely if at all corneate and about one ocular diameter or less caudad of anterior eyes; chaetotaxy 12-8 (112).

Tergites distinctly biseriate throughout; chaetotaxy 12:

$\frac{9}{13} : \frac{9}{12} : \frac{8}{12} : \frac{8}{10} : \frac{9}{10} : \frac{10}{10}$ Sternal chaetotaxy (segments 4-9):
 6 : 8 : 8 : 8 : 8 : 8. Sternites 4 to 10 weakly divided into lightly sclerotic scuta.

Coxal spines acuminate for most part, though individual blades may be terminally slightly bifid. The cheliceral and female genital structures have been completely illustrated elsewhere, as have the general palpal facies (l.c.). Chelicera with six accessory setae.

PROPORTIONS. Trochanter of palps 1.6-1.7 times as long as broad; femur 4.3 times as long as broad, and 1.7-1.8 times as long as the tibia; tibia 2.2 times as long as broad; chela 1.5 times as long as femur, 2.6 times as long as the tibia and 5.0-5.1 times as long as broad; fingers 1.6-1.7 times as long as broad. Leg IV: Miofemur about 2.4 times as long as deep and 1.4 times as long as tibia; tibia four times as long as deep; metatarsus about 2.8 times as long as deep; telotarsus as long as tibia and twice as long as the metatarsus.

MEASUREMENTS (mm.) Female (holotype). Total length 1.43 (erroneously given in original description as 1.6 mm.). Abdominal breadth 0.67. Carapace .492 long; .525 broad across eyes; .574 broad behind.

Palps: Trochanter .235 x .140; femur .508 x .118; tibia .295 x .131; chela .760 x .150 (depth undet.); hand .285 long; fingers .476 long. Leg IV: Miofemur .508 x .213; tibia .369 x .092; metatarsus .186 x .066; telotarsus .371 long.

OCCURRENCE AND REMARKS. Known only from the type material. The holotype is the only one specimen available for actual study. Cuba: Cayamas; Jamaica; Port Antonio.

The original description was a mere diagnosis designed to validate the name for use in another connection. This account, based on the holotype, should hereafter eliminate the necessity of reference to the original description.

³⁹Latin, of, or pertaining to, Cuba.

8. *Tridenchthonius juxtlahuaca*⁴⁰ n.sp.

FIGURES 13, 14 AND 15 O.

DIAGNOSIS. (Adults) Carapace (fig. 13, F) nearly quadrate, weakly but distinctly emarginate, smooth except laterally, where it is clearly tessellate (also somewhat minutely "hispidous," especially postero-laterally); with a distinct transverse furrow which marks off a very narrow tergite-like posterior disc which bears a transverse series of 8 setae; chaetotaxy 12-8 (90-100); anterior eyes only well developed, posterior eyes much reduced (mere spots or vestiges which are clearly visible only in alcoholic material, due to reflections from the tapetum) (fig. 13, F, J); epistomal process distinct, variable in form (triangularly dentate to lobately truncate (figs. 13, C, D, E).

Tergites smooth, biseriate but less distinctly so in the male; discal setae distinctly smaller than the border setae (figs. 13, H, I); mean tergal chaetotaxy (segments 1-12) of the male about

$$8: \frac{1}{8} : \frac{2}{8} : \frac{2}{8} : \frac{4}{8} : \frac{3}{8} : \frac{4}{8} : \frac{4}{8} : 9 : 6 : 4 : 0;$$

of the female:

$$10 : \frac{4}{10} : \frac{5}{9} : \frac{7}{8} : \frac{6}{9} : \frac{8}{9} : \frac{9}{8} : \frac{7}{7} : \frac{2}{8} : 6 : 4 : 0.$$

Sternites smooth, uniseriate; mean chaetotaxy (both sexes segments 4-12): 6:10:9:8:8:8:8:0:2; sternites 4 and 5 medially divided into weakly sclerotic scuta. Coxal spines of the usual type, comprising 6 (rarely 7) broadly acuminate, contiguous blades on each of coxae I and II; rarely 1 or 2 of the blades may have a terminal or subterminal tooth (fig. 15, O).

Male genitalic structures of typical facies, the border setae of the genital emargination of the posterior plate numbering 10 on either side. Female genital area typical: genital structures not specifically distinctive.

Chelicera of usual type (fig. 13, B); with 5 or 6 accessory setae. Palps smooth of typical facies (fig. 13, G). Palpal proportions (both sexes): trochanter 1.7 times as long as broad; femur 1.8 times as long as tibia and 3.9-4.2 times as long as broad; tibia 2.0-2.1 times as long as broad; chela 1.46 times as long as femur, 2.6-2.7 times as long as tibia and 4.4-4.7 times as long as broad; fingers 1.5-1.7 times as long as the hand, which is 1.7-1.9 times as long as broad.

Chela as illustrated (fig. 14, E); marginal teeth numbering 63-64 on the fixed and 53-54 on the movable fingers, respectively.

Legs of usual facies; metatarsus and telotarsus of leg IV with short pseudotactile setae (fig. 13, K); femur of leg IV 1.3-1.4 times as long as tibia and 2.1-2.2 (male) and 2.3-2.4 (female) times as long as deep.

⁴⁰Mexican place name of Aztec origin meaning "rabbit mountain." Used in non-Latinized form.

FIGURE 13

Tridenchthonius juxtlahuaca n.sp. (Adult).

- A—Subterminal aspect of anal opercula and peri-anal sclerites (tergites and sternites 10, 11 and 12) (semi-diagrammatic).
 B—Dorso-lateral aspect of left chelicera.
 C, D, E—Epistomal process showing variants.
 F—Carapace.
 G—Dorsal aspect of left pedipalp, including maxilla.
 H—Tergite 4 of male (normal aspect *in situ*).
 I—Tergite 4 of female (same scale as H, but flattened out).
 J—Sub-lateral aspect of left eyes of artificially flattened carapace.
 K—Fourth leg showing pseudofacile setae of tarsus.

(Figs. B, E, F, G from Holotype; C from Allotype; A, I, J, K from female (JC-1645.01008); D, H from male (JC-1645.01005)).

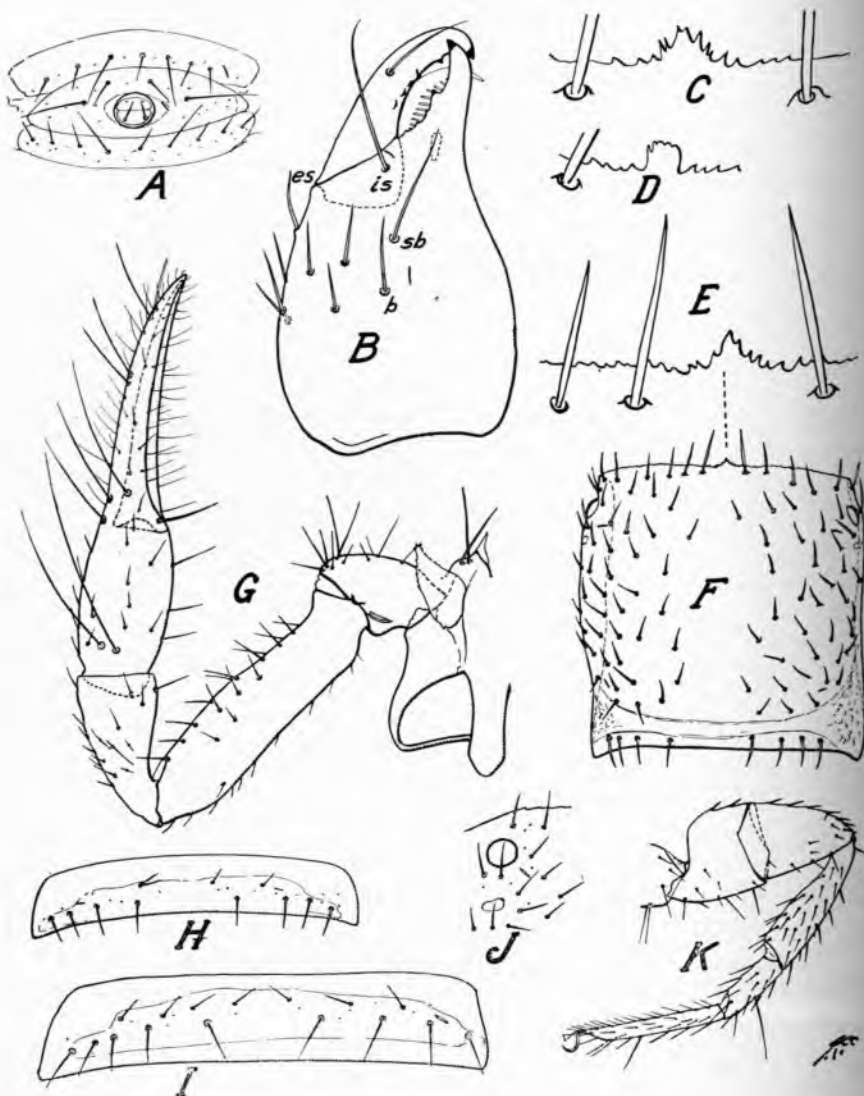
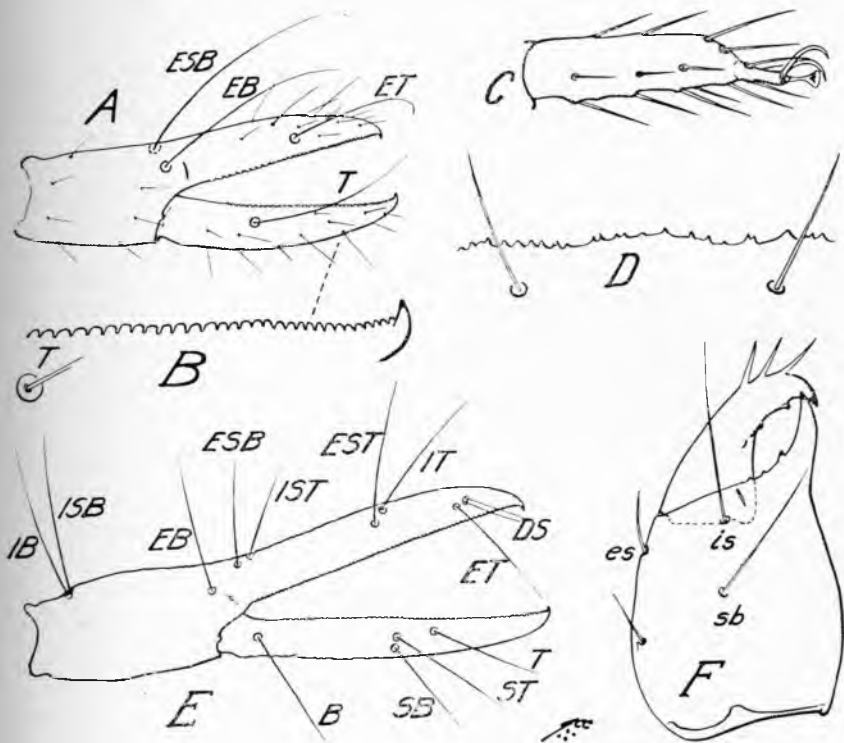


FIGURE 14

Tridenchthonius juatlahuaca n.sp.

- A—Exterior lateral aspect of right chela (protonymph).
 B—Dentition of movable finger of chela (protonymph).
 C—Miotarsus of leg I of protonymph.
 D—Epistomal region of carapace of protonymph.
 E—Exterior lateral aspect of right chela of adult male (holotype).
 F—Dorso-lateral aspect of left chelicera of protonymph (compare with fig. 13, B).
 (Illustrations for protonymph from specimen JC-1645.01003).



PROTONYMPH. The protonymph, even in those individuals not yet free from the enclosing larval membranes which bound them together and to the mother, show the trifid galea in the same form as persists throughout the nymphal life of representatives of this genus. The following descriptive items are given for the special purpose of comparison with the adult structures.

Carapace sub-quadrate; evidence of two pairs of eyes of which the anterior are most distinct; anterior border not at all emarginate; epistomal process not developed, but epistomal margin irregularly serrate (fig. 14, D); chaetotoxy much reduced as compared to adult, 4-4 (18). Tergites and sternites both uniseriate; bordered by 4 setae; tergites 9, 10 and 11 each with a sublateral pair of slender pseudotactile setae (those of eleventh segment para-anal in position). Chelicerae with facies similar to those of adult except for the presence of the triple galea and the absence of the galeal,

basal and all but one of the accessory setae (fig. 14, F). Palps of a facies similar to the adult, but distinctly more robust in proportions; trochanter 1.5 times as long as broad; femur 3.1 times as long as broad; tibia 1.6 times as long as broad; chela 1.7 times as long as femur, 2.5 times as long as tibia and 4.05 times as long as broad; fingers 1.8 times as long as hand, which is 1.5 times as long as broad. Chela with dentition of same type as in adult, marginal teeth numbering 35-37 on either finger (fig. 14, A, B); with greatly reduced chaetotaxy, only a single seta occurring on the movable and 3 on the fixed finger, respectively (fig. 14, A). The homologies of these setae cannot yet be given with any certainty. IT and IST which occur dorsally at the base of the hand in the adult are definitely missing, however, as is the double seta DS which is always present near the tip of the fixed finger in all known adult Chthonioidea. Our own tentative belief at present is that the seta occurring on the movable finger is probably T, while those occurring on the fixed finger are likely ET, ESB and EB. The coxal area is essentially similar to that of the adult in its general appearance as are the legs. The coxal spines occur in the protonymph as in the adult, except that they comprise fewer (3 on each of coxae I and II) and possibly relatively smaller blades which are individually terminally incised or "fringed." In this latter feature they differ from the adult, in which they are almost or quite acuminate. This might possibly indicate that these nymphs are not to be associated with this species, although this seems a highly doubtful supposition. Curiously enough the intercoxal tubercle, which we have interpreted as a vestige of the true sternum and which occurs in the adults of all species of *Tridenchthonius*, is absent from the protonymph. The segmentation of the legs is essentially the same as in the adult, as are the tarsal claws and arolium. All tarsi constricted just proximad of the pretarsus as in the adult, although more conspicuously so (fig. 14, C).

MEASUREMENTS. (mm.) Holotype, male (JC-1645.01001). Total length 1.12. Carapace .43 long; .43 broad across eyes. Palps: trochanter, .195 x .114; femur, .416 x .107; tibia .236 x .118; chela .604 x .129; hand .254 long; fingers .386 long. Leg I: basifemur .258 x .061; telofemur .177 x .053; tibia .144 x .046; miotarsus .248 x .037. Leg IV: miofemur .416 x .191; tibia .312 x .085; metatarsus .147 x .055; telotarsus .305 x .037.

Allotype, female (JC-1645.01002). Total length 1.48. Carapace .44 long, .46 broad across eyes. Palps: trochanter, .212 x .125; femur .445 x .106; tibia .245 x .121; chela .655 x .145; hand .250 long; fingers .397 long. Leg I: basifemur .272 x .067; telofemur .177 x .059; tibia .162 x .050; miotarsus .265 x .040. Leg IV: miofemur .449 x .186; tibia .318 x .086; metatarsus .158 x .055; telotarsus .309 x .040.

Protonymph (JC-1645.01003). Total length .46. Carapace .23 long. Palps: trochanter .103 x .068; femur .171 x .054; tibia .114 x .070; chela .291 x .072; hand .107 long; fingers .188 long.

MATERIAL. Holotype, male (JC-1645.01001); Allotype, female (JC-1645.01002); paratypes 10 ♂, 6 ♀ and 2 protonymphs (JC-1645.01003-20). Also included in the type collection is a mass of 9 tritonymphs not yet freed from the larval membranes (JC-1645.01021). These were detached and

loose in the vial when received, but were probably attached to one of the females when collected. All material from the Cave of Juxtlahuaca near Colotlipa, Mexico (in bat dung(?) ("Murcielaguina")). ("Colotlipa; Cueva de Juxtlahuaca; Gro. 17-I-1941. "Murcielaguina." F. Bonet collection (No. 212)). Holotype, allotype and all paratypes except 3 ♂, 3 ♀ and 2 protonymphs returned to F. Bonet (Escuela Nacional de Ciencias Biológicas in Mexico City). The retained specimens will ultimately be divided between the U. S. National Museum, the University of Utah, Department of Zoology and Stanford University, Department of Zoology.

REMARKS. The allotype and one of the paratype females included in this collection carried a discal cluster of developing larvae attached to the vulva. The number of larvae was 8 and 10, respectively.

This cave-inhabiting species is very close to *Tridenchthonius mexicanus* n. sp., from which it is very probably derived. Although found, presumably, in the darker parts of the cave (in association with bats), it does not show in any significant degree any of the usual modifications characteristic of permanent cave inhabitants. The vestigial character of the posterior eyes is not unique, but occurs in certain of the free living members of the genus as well.

9. *Tridenchthonius mexicanus*⁴¹ n. sp.

FIGURE 15, A-N.

DIAGNOSIS. (Adults) Extremely similar in general appearance and principal morphological characteristics to *T. juxtlahuaca* n. sp. Carapace (fig. 15, C, G) nearly quadrate; weakly but distinctly emarginate anteriorly; smooth or nearly smooth, except laterally, where it is clearly tessellate; with a distinct but not conspicuous transverse furrow posteriorly which delimits a narrow tergite-like posterior disc which bears 6 (sometimes 7) setae; chaetotaxy somewhat variable, but averaging about 12-6 (75 to 88); with 4 eyes, the posterior pair of which, while less corneate and conspicuous than the anterior pair, are nevertheless quite distinct (figs. 15, C, G); epistomal process variable, generally well developed, dentate or sometimes lobate (figs. 15, L, M, N).

Tergites smooth, biseriate but less conspicuously so in the male; mean
 tergal chaetotaxy of the male $8 : 8 : \frac{0 \text{ to } 4}{8} : \frac{0 \text{ to } 4}{8} : \frac{2 \text{ to } 4}{8} : \frac{1 \text{ to } 4}{8} : \frac{2 \text{ to } 4}{8} :$
 $\frac{4}{5 \text{ to } 8}$; of the female $8 : \frac{2 \text{ to } 5}{8 \text{ to } 9} : \frac{6 \text{ to } 7}{8} : \frac{5 \text{ to } 7}{8} : \frac{5 \text{ to } 7}{8} : \frac{5 \text{ to } 8}{8} : \frac{5 \text{ to } 8}{8} :$
 $\frac{6 \text{ to } 8}{8} : \frac{4 \text{ to } 7}{8}$.

Sternites smooth, uniseriate; chaetotaxy in both sexes (segments 4-12) 6:10:10:8 or 9:8 or 9:8 or 9:8 or 9:0;2; sternites 4 and 5 of male and 4-7 of female divided into more or less distinct scuta.

⁴¹Of or pertaining to Mexico.

Coxal spines of the usual arrangement comprising 5 (rarely 6) contiguous, broad and terminally incised or dentate blades on each of coxae I and II (figs. 15, H, I, J, K). Occasionally a few of the blades may be acute, but some at least are distinctly incised.

Male genitalia of usual type, not specifically distinctive; genital emargination of posterior plate guarded on either side by 9 to 12 (generally 10) setae. Female genital area typical, not specifically distinctive.

Chelicerae of usual type (fig. 15, B); with 5 to 8 (mostly 6 or 7) accessory setae. Palps smooth, of usual facies. Palpal proportions (both sexes; greatest observed range given with the mean in parenthesis). Trochanter 1.7-1.9 (1.74) times as long as broad; femur 1.7-1.8 (1.75) times as long as tibia and 3.9-4.4 (4.14) times as long as broad; tibia 2.0-2.1 (2.06) times as long as broad; chela 1.4-1.6 (1.50) times as long as femur; 2.5-2.7 (2.63) times as long as tibia and 4.6-4.8 (4.70) times as long as broad; fingers 1.7-1.9 (1.85) times as long as hand, which is 1.6-1.7 (1.66) times as long as broad.

Chela of usual facies (fig. 15, A); marginal teeth numbering 61-70 on the fixed and 52-57 on the movable fingers, respectively.

Legs of usual type, metatarsus and telotarsus of leg IV with short pseudotactile setae as in *T. juxtlahuaca* n. sp. Fourth femur sexually differentiated as in preceding species, 2.4-2.5 (2.44) times as long as deep in the male and 2.5-2.7 (2.59) times as long as deep in the female.

TRITONYMPH. Very similar to the adult in all but size. The chaetotaxy in general is reduced and the palpal proportions are somewhat more robust. The principal differences consist in the presence of the triple galea (fig. 15, F) and in the reduced chaetotaxy of the chela (fig. 15, D), carapace and tergites. It is to be noted that the chaetotaxy of the chelicera is essentially the same as in the adult, except that only 4 accessory setae instead of the usual 6 occur (fig. 15, F). The marginal teeth of the chela are somewhat fewer than in the adult (48 on the movable and 60 on the fixed finger). Ten of the normal 12 tactile setae of the chela are present, only B and IB (or ISB?) being absent (fig. 15, D). Setae SB and ST clearly separated, unlike the adult where they are contiguous (compare figs. 15, D and 15, A); the double sensory seta DS is present as in the adult. The chaetotaxy of the carapace is reduced in total number, but the anterior and posterior border setae are the same as in the adult, formula 13-6 (50-55); tergites strictly uniseriate, with 8 border setae per tergite.

FIGURE 15.
Tridenchthonius mexicanus n.sp.

- A—Exterior lateral aspect of right chela of adult (♀ JC1637.01004).
- B—Dorsolateral aspect of right chelicera of adult (♀ JC-1637.01004).
- C—Dorsal aspect of left half of male carapace (♂ JC-1707.01001).
- D—Exterior lateral aspect of right chela of tritonymph (JC-1707.01003).
- E—Tip of fixed finger of chela of tritonymph (JC-1707.01003).

F—Dorsolateral aspect of left chelicera of tritonymph (JC-1707.01003).

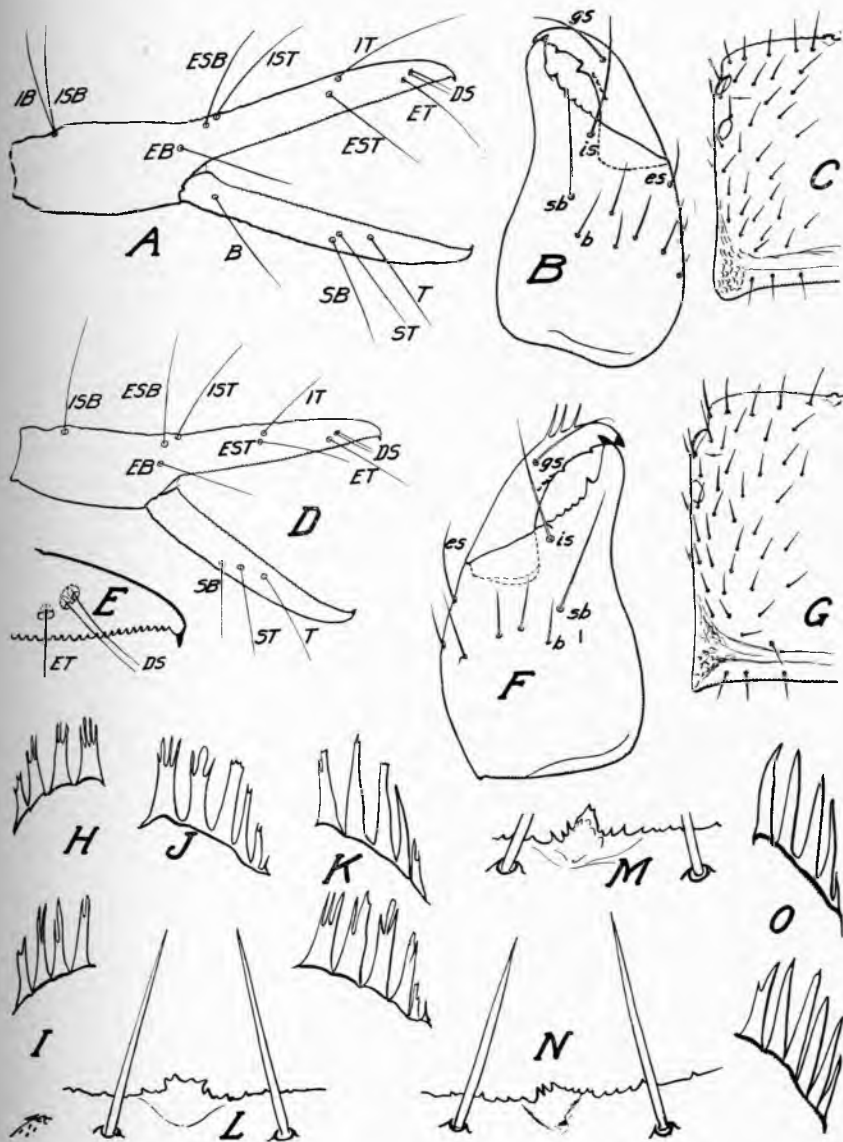
G—Dorsal aspect of left half of female carapace (JC-1637.01004).

H, I, J, K—Coxal spines of various specimens showing structural variation (JC-1637.01003 (coxa II, left), 1637.01002 (coxa II, left), 1637.01004 (coxa II, right) and 1647.02002 (coxae I and II, right), respectively).

L, M, N—Epistomal process showing variants (JC-107.01001, 1647.02001, and 1637.01004, respectively).

Tridenchthonius juxtlahuaca n.sp.

O—Coxal spines ♀—JC-1645.01006 (coxae I and II, right).



Sternites 4-7 divided into scuta as in female, bordered by 8 marginal setae. The palps are somewhat more robust than in the adult; trochanter 1.6-1.7 times as long as broad; femur 1.5 times as long as the tibia and 3.6-3.8 times as long as broad; tibia 2.0 times as long as broad; chela 1.5-1.6 times as long as the femur, 2.4-2.5 times as long as the tibia and 4.4-4.5 times as long as broad; fingers 1.6 times as long as the hand which is 1.7-1.8 times as long as broad; femur of 4th legs 2.4 times as long as broad. The coxal spines and intercoxal tubercle present and structurally similar to those of the adult.

MEASUREMENTS (mm.) Means (6 ♂) (JC-1637.01001, 1637.01003, 1647.02001, 1647.02003, 1706.01001 and 1707.01001). Length 1.11. Carapace .40 long; .40 broad anteriorly. Palps: trochanter .194 x .113; femur .413 x .099; tibia .234 x .113; chela .612 x .129; hand .218 long; fingers .394 long. "Miofemur" of leg IV .402 x .164.

Means (6 ♀) (JC-1637.01002, 1637.01004, 1646.01001, 1647.02002, 1706.01002 and 1707.01002). Length 1.41. Carapace .43 long; .45 broad anteriorly. Palps: trochanter .211 x .120; femur .446 x .108; tibia .256 x .125; chela .677 x .145; hand .235 long; fingers .446 long. "Miofemur" of leg IV .439 x .169.

Measurements of individual representatives. Holotype, male (JC-1647.02001). Total length 1.03. Carapace .39 x .39. Palps: trochanter .188 x .107; femur .388 x .096; tibia .224 x .110; chela .592 x .129; hand .206 long; fingers .386 long. Leg I: basifemur .243 x .059; telofemur .158 x .052; tibia .136 x .044; miotarsus .237 x .035; leg IV: "miofemur" .386 x .163; tibia .291 x .077; metatarsus .140 x .052; telotarsus .270 x .037.

Allotype, female (JC-1647.02002). Total length 1.34. Carapace .43 x .46. Palps: trochanter .210 x .121; femur .436 x .106; tibia .250 x .125; chela .670 x .144; hand .228 long; fingers .440 long. Leg I: basifemur .267 x .063; telofemur .184 x .056; tibia .155 x .046; miotarsus .265 x .038. Leg IV: "miofemur" .397 x .151; tibia .269 x .064; metatarsus .121 x .044; telotarsus .258 x .037.

Tritonymph (topoparatype) (JC-1647.02004). Total length .97. Carapace .34 long; .36 broad anteriorly. Palps trochanter .167 x .099; femur .301 x .083; tibia .201 x .099; chela .491 x .110; hand .177 long; fingers .316 long. Leg I: basifemur .183 x .055; telofemur .129 x .052; tibia .112 x .045; miotarsus .197 x .040. Leg IV: "miofemur" .316 x .131; tibia .228 x .066; metatarsus .110 x .053; telotarsus .224 x .044.

MATERIAL. All from Mexico. Holotype ♂ (JC-1647.02001); allotype ♀ (JC1647.02-002); topoparatypes 2 ♂, 7 ♀ (all gravid) and 3 tritonymphs (JC-1647.02003-14), Vera Cruz: "El Potrero, 12-XI-1941. Cafetal tronco podrido." (Decaying log of coffee tree). C. Bolivar and F. Bonet Coll. (Bonet No. 456).

PARATYPES. 7 ♂ and 13 ♀ (all gravid) (JC-1637.01001-20), Vera Cruz, "Atoyac 12-XI-1941: Bajo cortezan." (Under bark), Coll. C. Bolivar and F. Bonet. (Bolivar collection). 1 tritonymph (JC-1701.001), Vera Cruz,

"Atoyac, 13-XI-1941. Cafetal. Bajo cortezas." (Under bark of felled coffee tree). Coll. F. Bonet. (Bonet No. 458). 1 ♀ (gravid) (JC-1646-01001) Chiapas: "La Esperanza. Cafetal. Hojarasca humeda." (Felled coffee tree. In moist leaves). F. Bonet Coll. (Bonet No. 135). 2 ♂, 3 ♀ (gravid) (JC-1706.01001-5) Chiapas: "La Esperanza, 800 M. alt. 15-IX-1939. Bajo cortezas." (Under bark). Coll. C. Bolivar & D. Pelaez. (Bolivar Collection). 3 ♂, 4 ♀ (gravid) and 1 tritonymph (JC-1707.01001-8) Chiapas: "La Esperanza, 18-IX-1939. Debajo de cortezas podridas" (Under decaying bark). Coll. C. Bolivar and D. Pelaez. (Bolivar Collection).

With the exception of 16 paratypes, all material returned to F. Bonet (Escuela Nacional de Ciencias Biologicas at Mexico City). The retained paratypes will eventually be divided among the collections of the University of Utah, the U. S. National Museum and Stanford University.

REMARKS. In some respects this species seems to be rather variable, but we can see no present basis for suspecting that more than a single form is involved. It is undoubtedly very closely related to *Tridenchthonius juxtla-huaca* n. sp.

It is primarily studies of the tritonymphal specimens included in the collections on which this species is based that have convinced me that this and its related species are congeneric with Balzan's *Tridenchthonius parvulus*, thus permitting the redefinition of that genus in modern terms.

Practically all the females in this collection were gravid (i.e., carrying a discal packet of developing embryos or larvae). Apparently most, if not all, of these collections were taken in the fall (September and November). The numbers of larvae per female varied from 5 to 12 and averaged (for 24 females) between 8 and 9. The actual frequency distribution was: 1 with 5; 1 with 6; 7 with 7; 4 with 8; 5 with 9; 2 with 10; 1 with 11; and 3 with 12.

13. Genus COMPSADITHA⁴² Chamberlin

FIGURES 2, A, F, G AND 16.

ORTHOTYPE. *Compsaditha pygmaea* Chamberlin.

1929. *Compsaditha* Chamberlin, Ann. Mag. Nat. Hist. Ser. 10, 4:62.

1931. *Compsaditha* Chamberlin, Chamberlin, The Chelonethida, p. 211.

1932. *Compsaditha* Chamberlin, Beier, Das Tierreich, 57:29.

1937. *Compsaditha* Chamberlin, Roewer, Bronn's Klass. u. Ord. des Tierreichs. 5:(4:6):235.

DIAGNOSIS. Marginal teeth of chela small, acute to rounded; very closely contiguous and as well developed caudally as anteriorly on both fingers (fig. 16, C).

Chaetotaxy of chela as illustrated (fig. 16, C). Seta ET subterminal and about one areolar diameter caudad of DS. IT and EST distinctly distad of median and closely adjacent ($1\frac{1}{2}$ -2 areolar diameters); IT about 4 times as far from ET as from EST; IST, ESB, and EB in oblique, basal series; ESB distinctly closer to IST than to EB. ST and SB slightly but distinctly proximad of median and contiguous or subcontiguous (not

⁴²Greek, *compos*, pretty, elegant, + *Ditha*.

more than one areolar diameter apart); T distad of median and 3 to 4 areolar diameters distad of ST; B basal and about 3 times as far from SB as from the finger base.

Palpal facies normal but robust; no unique modifications.

Carapace and palps nearly or quite smooth and polished; anterior carapacial margin nearly or quite transverse and with a distinct, serrate, epistomal process; with no trace of a posterior transverse furrow; with four eyes, the posterior pair of which are reduced; with a relatively sparse vestiture of robust, acuminate setae (total 50-80). Tergites uniseriate or at most obscurely biseriate posteriorly; the marginal setae numbering about 8-12.

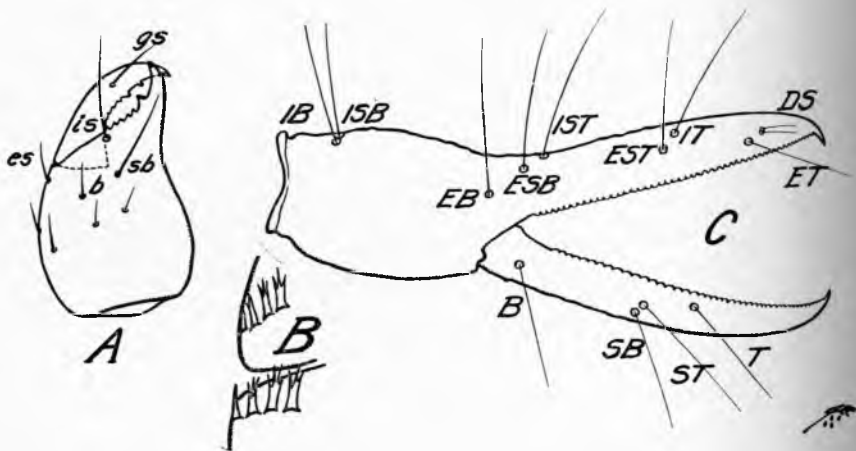
FIGURE 16

Compsaditha pygmaea Chamberlin

A—Dorso-lateral aspect of left chelicera. Serrulae omitted.
(Female, JC-550.05001).

B—Coxal spines (Female, JC-550.05004).

C—Exterior lateral aspect of right chela (Female, JC-550.05001).



Coxal spines of usual type, consisting of from three to five blades per coxa; individual blades terminally incised (fig. 16, B), in type at least.

Monosetose intercoxal tubercle present.

Chelicerae of usual facies (fig. 16, A); accessory setae numbering three to four.

Metatarsus and telotarsus IV each with a long and slender submedian pseudotactile seta (fig. 2, G).

Presence or absence of abdominal tactile setae not observable in available material.

INCLUDED SPECIES AND GEOGRAPHICAL RANGE. Three species are here considered to belong to the genus. One is from the Philippines; one is from the Gold Coast of Africa, while the third is from South America (Paraguay) (the latter two species transferred from *Ditha* as defined by Beier l.c.).

REMARKS. In the original diagnosis a mistake, probably an unobserved typographical error, was made in describing the tactile setae of the

movable finger. The description erroneously indicated that T and ST were subcontiguous, rather than ST and SB. *Compsaditha* is very close to *Tridenchthonius* and later researches based on new material may show it to integrate with that genus.

The three included species may be separated by means of the following

key:

KEY TO SPECIES OF COMPSADITHA.

1. Carapace with about 52-54 vestitural setae; chela not more than 4.3 times as long as broad 2
- Carapace with about 80 vestitural setae; chela 4.9 times as long as broad; from Africa (Gold Coast) 2. *aburi* n. sp.
2. (1) Tergites irregularly uniseriate and tending toward an obscure biseriate condition; seta ST and SB separated by about one areolar diameter; femur about 4 times as long as broad; chela 4.1-4.2 times as long as broad; from Paraguay 1. *fiebrigi* (Beier)
- Tergites evenly uniseriate; setae ST and SB almost contiguous; femur 3.3-3.5 times as long as broad; chela 3:5-3.7 times as long as broad; from the Philippines 3. *pygmaea* Chamberlin

1. *Compsaditha fiebrigi*⁴³ (Beier)

1919. *Chthonius parvidentatus* Ellingson (*nec* Balzan) Mitt. Zool. Zool. Mus. Berlin, 4:(3) (Misdetermination.)
1931. *Ditha fiebrigi* Beier, Zool. Anz. 93:50.
1932. *Ditha fiebrigi* Beier, Beier, Das Tierreich, 57:27, t.f. 33 (chela).

REMARKS. Although, in some respects, possibly "intermediate" between *Tridenchthonius* and *Compsaditha* this species seems to fall most naturally into the latter genus, as shown by the relatively sparse chaetotaxy and more especially by the detailed chaetotaxy of the chela. It is not close, systematically speaking, to the orthotype. A re-examination of the types of this species must be made before its systematic position can be regarded as secure.

OCCURRENCE. Known only from type collection (originally containing two males and two females. Beier described the species from a single female, probably one of the original four). Taken at San Bernardino, Paraguay, by K. Fiebrig. The type is in Berlin Museum.

2. *Compsaditha aburi*⁴⁴ n. sp.

1930. *Afroditha serrulata* Beier (*nec* Silvestri) (misdetermination). Boll. Lab. Zool. gen. e Agrar. Portici. 25:48, t.f. 6A and B (pedipalp and movable finger of chela).
1932. *Ditha serrulata* (Beier) (*nec* Silvestri), Beier, Das Tierreich, 57:27. (This description does not fully agree with that given by Beier in 1930. It may be a mosaic combining elements from both his description of 1930 and Silvestri's original description of "*Chthonius serrulatus*" (= *Tridenchthonius serrulatus* (Silvestri) with which Beier mistakenly identified his specimen.)

DIAGNOSIS. Material of this form is not available for first-hand study and the species is considered to be defined by Beier's description and figures of 1930 (l.c.). For convenience of reference the essential points noted in Beier's account are summarized herewith.

⁴³Named in honor of K. Fiebrig, the original collector of the species.

⁴⁴Native African (Gold Coast) place name of undetermined significance. Pagan form, not Latinized.

Carapace as broad as long, only slightly narrowed posteriorly; with about 80 vestitural setae; anterior margin depressed (emarginate); epistomal process triangular and laterally denticulate; with but a single pair of eyes, which latter are more than their own diameter caudad of the anterior margin. Tergites uniseriate, with about 12 marginal setae each. Flagellum of 9 pinnate blades. Chaetotaxy and dentition of chela (see Beier, 1930, l.c., t.f., 6, A and B) as in the genus; ST and SB slightly caudad of median, almost transversely contiguous and closer to B than the distance between T and the finger-tip. Tibia 2.36 times as long as broad; chela 2.5 times as long as tibia and 4.9 times as long as broad; fingers 1.75 times as long as hand. Coxal spines simple and numbering 5 per coxa. Monose-tose intercoxal tubercle present.

MEASUREMENTS. (mm.) Female (holotype). Total length 1.3. Carapace .3 long. Palps: tibia .26 x .11; femur indet.; chela .66 x .135; hand .24 long; fingers .42 long.

OCCURRENCE AND REMARKS. It is possible that Beier received the specimen upon which this species is based in exchange from Silvestri as a presumed representative of *Chthonius serrulatus* Silvestri. In any case it is apparently one of the two females recorded, in Silvestri's original description of that species, as paratypes from Aburi, where they were collected from decaying debris under a log ("sotto un tronco d'albero in putrefazione"). The damaged female (palpal femur crushed) upon which Beier based his description and figures of 1930, is here designated as the holotype of the present species (*Compsaditha aburi* n.sp.).

The chaetotaxy of the movable finger of the chela as illustrated by Beier (1930, l.c.) and his statement that the tergites possess a uniseriate row of 12 marginal setae clearly places the species in *Compsaditha* as here defined and not in *Tridenchthonius*, where Silvestri's *serrulatus* is referred.

3. *Compsaditha pygmaea*⁴⁵ Chamberlin

FIGURES 2, A, F, G, AND 16

1929. *Compsaditha pygmaea* Chamberlin, Ann. Mag. Nat. Hist. Ser. 10, 4:62.

1931. *Compsaditha pygmaea* Chamberlin, Chamberlin, The Chelonethida, figs. 19, A (p. 84) (coxal area); 21, C (p. 92) (intercoxal tubercle); and 21, G (p. 92) (coxal spines).

1932. *Compsaditha pygmaea* Chamberlin, Beier, Das Tierreich, 57:30.

DIAGNOSIS. (Addenda based on female holotype). The original diagnosis of this species was incomplete and merely designed to validate the name for other uses. This description thus supplants the earlier references.

Carapace subquadrate slightly broader than long; smooth; anterior margin transverse, with a distinct dentate, epistomal process; with 4 eyes, of which the posterior pair are much reduced, scarcely convex and caudad twice the diameter of the anterior eyes; setae robust and acuminate; chaetotaxy 12-6(52). Tergites smooth, scarcely if at all tessellate; with 9-12 robust and acuminate marginal setae. Sternites smooth, weakly divided into lightly sclerotic scuta; chaetotaxy (fourth to eighth segments) 6:10:8:8:8.

⁴⁵Latin, *pygmaeus*, dwarfish; implication, smallness.

Sternal setae slenderly acuminate. Coxal spines numbering 4 on each coxa; the blades terminally deeply incised (fig. 16, B). Female genital area of typical facies (fig. 2, A). Presence or absence of abdominal pseudotactile setae not determinable (may have been broken off). Legs of usual facies; metatarsus of leg IV, at least, with a long and slender, median pseudotactile seta; one probably also occurs on the telotarsus, but has been broken from the available specimens (fig. 2, F, G).

Chelicerae of usual form (fig. 16, A); with 4 accessory setae.

Chaetotaxy and dentition of chela as illustrated (fig. 16, C).

Palps robust, the trochanter 1.8 times as long as broad; femur 3.3-3.6 times as long as broad and 1.8 times as long as tibia; tibia 1.7 times as long as broad; chela 1.4-1.5 times as long as femur, 2.6-2.7 times as long as tibia and 3.5-3.7 times as long as broad; fingers 1.8-1.9 times as long as hand. Leg IV: "miofemur" 2.4 times as long as deep and 1.2-1.3 times as long as tibia; tibia 3.6 times as long as deep; metatarsus 2.4 times as long as deep; telotarsus distinctly shorter than tibia.

MEASUREMENTS. (mm.) Female (holotype). Total length 1.10. Abdominal breadth 0.41. Carapace 0.34 long; 0.35 broad across eyes and 0.39 broad across caudal border. Palps: trochanter 0.168 x 0.093; femur 0.336 x 0.093; tibia 0.187 x 0.112; chela 0.485 x 0.137 (0.140 deep); hand 0.172 long; fingers 0.313 long. Leg IV: "miofemur" 0.320 x 0.131; tibia 0.252 x 0.070; metatarsus 0.112 x 0.047; telotarsus 0.210 long.

OCCURRENCE. Known only from the type collection. Philippine Islands: (Luzon; Mt. Makiling).

2. Subfamily CECODITHIINAE nov.

DIAGNOSIS. Coxal spines lacking from coxae I and II. Setae IB and ISB distinctly submedian on dorsum of hand of chela (fig. 17, A and B). Chelicera of adult with a simple galea (in male holotype of only included species).

REMARKS. Includes at present only the monotypic type genus *Cecoditha* from Argentine.

14. Genus CECODITHA⁴⁶ Mello-Leitao

FIGURE 17.

1939. *Cecoditha* Mello-Leitao, Notas del Museo de la Plata. 4:(Zoologia No. 17):115.

OROTHOTYPE: *Cecoditha parva* Mello-Leitao.

DIAGNOSIS. Marginal teeth of chela blunt, contiguous and equally developed on the fixed and movable fingers.

Chaetotaxy of chela as illustrated (fig. 17). Position of setae ET and DS unknown (neither figured nor described by author), but probably subterminal, as is typical in the family; both IT and EST slightly but dis-

⁴⁶*Ceco*, probably a simplified form of the Latin word *caecus*, meaning blind, + *Ditha*.

tinctly distad of median and closely adjacent (one areolar diameter or less apart); EB and ESB basal in position as is typical; position of seta IST unknown (not described or surely illustrated by author), but possibly somewhat caudad of EB and ESB; setae IB and ISB, only slightly caudad of median. T and ST distinctly distad of median, closely proximate (about one areolar diameter apart); SB slightly caudad of median and closer to ST and T than to B; seta B subbasal in position.

Palpal facies normal; without marked points of specialization (fig. 17-A).

Carapace and palps smooth, with a few hispidous granulations ("algunas espinas"). Carapace truncate, not narrowed posteriorly; anterior margin finely serrate; epistomal process absent. Eyes absent. Chaetotaxy of carapace unknown. Tergites "with a row of small setae."

Coxal spines absent from coxae I and II.

Character of coxa I unknown (not described).

Intercoxal tubercle absent.

Cheliceral chaetotaxy not described; movable finger (of male at least) with a simple galea ("galea sencilla.") Flagellum comprises 6 plumose setae.

Tactile setae of 4th tarsi unknown (not described). Femur-basis of legs I and II much longer than the femur-tibialis, each with a pair of stout ventral setae; femur basis of legs III and IV as long as femur-tibialis. Arolia of tarsi simple, as usual in the family.

REMARKS. Includes only the type species.

The characters of this genus, while incompletely described by Mello-Leitao, are so strikingly different from other known genera that its segregation in a separate subfamily seems necessary. The absence of the coxal spines; the submedian position of setae IB and ISB and, above all, the presence of a galea in the adult male, are points of particular interest.

1. *Cecoditha parva*⁴⁷ Mello-Leitao

FIGURE 17.

1939. *Cecoditha parva* Mello-Leitao, Notas del Museo de la Plata. 4: (Zoologia No. 17): 116-117; ff. 1a (pedipalp); 1b (chela).

OCCURRENCE AND REMARKS. Mello-Leitao described this unusual species from a single male (Type No. 20503 in the Museo de La Plata) from Argentine ("Madryn Chubut"). Aside from the palpal measurements, the preceding generic diagnosis includes practically everything of diagnostic value, as far as Mello-Leitao's description is concerned. It is regrettable that he omitted mention of the detailed chaetotaxy, particularly of the carapace, tergites and chelicerae, as well as failing to indicate completely that of the chela (i.e., setae IST, ET and DS). He also failed to describe the detailed dentition of the chela (number of marginal teeth).

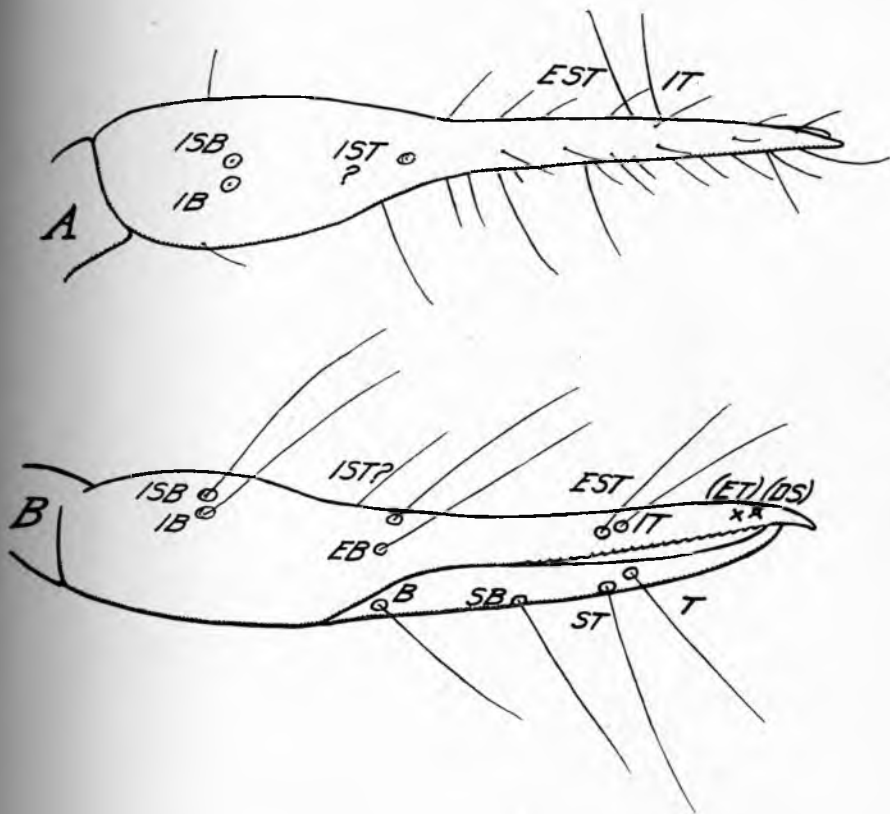
⁴⁷Latin, *parvus*, small or minute.

FIGURE 17.
Cecoditha parva Mello-Leitao.

(From Mello-Leitao, 1939. Modified.)

A—Dorsal aspect of left chela of male. Identity of seta IST doubtful.

B—Subdorsal aspect of right chela of male. Positions of setae IST, ET and DS not shown in original. The seta indicated as IST doubtful; probable approximate positions of setae ET and DS indicated by cross and crossed circle, respectively.



The measurements for this species as given by Mello-Leitao are reproduced herewith. All are based on the male holotype and only known specimen.

Total length 1.2 mm. Palps: femur, .42 x .08; tibia .20 x .10; chela .62 x .12; movable finger .40.

Palpal proportions (basis of foregoing measurements): femur 5.2 times as long as broad; tibia twice as long as broad; chela 5.2 times as long as broad; fingers barely shorter than femur.